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BRITISH MEDICAL JOURNAL

JOURNAL OF THE BRITISH MEDICAL ASSOCIATION

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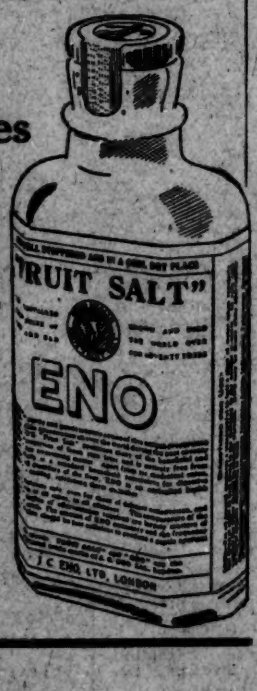

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BRITISH MEDICAL JOURNAL

LONDON SATURDAY FEBRUARY 10 1945

THE MEDICAL CORPS IN RED ARMY OPERATIONS

ITS TASKS AND THEIR FULFILMENT

BY

Prof. YEFIM SMIRNOV

Colonel-General of the Red Army Medical Corps

In the fighting against the German invaders the Medical Corps of the Red Army has played an important part. The enormous scope of the operations which began suddenly in June, 1941, along a front stretching from the Barents Sea to the Black Sea made large-scale organization in the Medical Corps essential: during the period of intensive fighting on the defence the necessary units—field, army base, and front hospitals, clearing stations, and anti-epidemic institutions—were formed and equipped; an extensive network of medical institutions was organized in the rear areas; and doctors—especially surgeons—were allotted posts in accordance with their specialties. The large number of medical workers who entered the Army had to be trained in the problems of war medicine, in the methods employed in dressing and clearing stations, and in anti-epidemic technique during the course of military operations.

The Objective

In this war the Red Army Medical Corps has been and still is faced with quite concrete tasks which entail the employment of the latest ideas in war medicine. These tasks are as follows: (1) To return the maximum number of wounded to the ranks. (2) To reduce to a minimum the cases of mortality among sick and wounded at all stages of evacuation. (3) To reduce to a minimum disablement among those wounded in battle; to ensure that the maximum number of wounded retain their ability to work when their injuries prevent further service in the Red Army. (4) To prevent the spread of epidemics among the troops.

The personnel establishment of the Medical Corps, the tactics adopted under various war conditions, and the equipment and training of the personnel were all directed towards fulfilling these tasks as efficiently as possible. Success in this respect has only been possible because the Red Army Medical Corps works in accordance with a simple doctrine of war medicine under field conditions. In the main this doctrine is based on the following principles: (*a*) A uniform conception of the origin, development, and progress of diseases, and of the principles of surgical and therapeutical work in the field. (*b*) Correct sequence in the treatment of sick and wounded at various stages during their evacuation. (*c*) The obligatory employment of brief, accurate, and consistent medical documents, enabling the sick and wounded to be classified in a thorough manner and their treatment to be uniform at all stages of evacuation. (*d*) A single school of thought, with uniformity in methods of prophylaxis and treatment of sick and wounded at the various stages of evacuation. This school must be based on all that is best in modern medical science, both in the theoretical and in the practical sphere.

In modern warfare the work of the surgeons and its organization are of the utmost importance in the fulfilment of the tasks with which the Medical Corps is faced. The experience gained in war medicine during the 20th century has shown that all gunshot wounds are primarily infected. Naturally the most reliable method of combating the infection of wounds is by early primary treatment. A large number of wounded need early surgical measures, and the best results are obtained when wounds are treated within a few hours of their infliction. This fact to a very considerable extent determines the organization and tactics of the Medical Corps in the field under various war conditions.

To ensure that gunshot wounds are treated surgically as soon as possible we have organized our field units in such a way that the wounded are removed from the battlefield even under enemy small-arm and mortar fire and given skilled surgical treatment in the field medical units. This procedure is dictated by two considerations: first, mortality among wounded in the forward area is most often due to loss of blood; and, secondly, in the army and forward base zones gunshot wounds are complicated by gas gangrene, sepsis, and shock. The chief task of the forward medical units, therefore, is to combat serious loss of blood and to give prophylactic treatment against complication of wounds. For those categories of wounded who require specialized treatment (wounds of skull, eyes, jaws, thorax, the principal long bones, and the larger joints) the Red Army Medical Corps has arranged for this to be given in all institutions, beginning with the mobile field hospitals operating in the zone of the army base. The treatment and evacuation of the slightly wounded and of medical cases are dealt with separately, beginning with the forward units. Mobile therapeutic field hospitals and mobile field hospitals for the slightly wounded are a component part of the medical service of the army in the field.

Principles of Treatment and Evacuation of Wounded

In general, the treatment of wounded in the Red Army is based on a system which deals with each stage of evacuation to a definite destination. This system consists in dividing treatment into a number of stages, without the establishment of specialized hospitals and departments. At each stage the wounded are treated by specialists, and at the same time are evacuated into rear areas of the country. Evacuation is not carried out mechanically from stage to stage, but depends on the type of wound and the condition of the evacuee and also on conditions at the front. Treatment given at the stages of evacuation is consistent and consecutive, progressing in scope and method as the distance from the forward medical stations increases. It is very important to stress the fact that the scope and methods of treatment, the organization, and the speed of evacuation are determined more by the military situation than by purely medical considerations. The following points have therefore to be taken into consideration: the type of operation in which the troops are engaged; the number and the rate of arrival of sick and wounded; the number of qualified doctors, especially surgeons, available at a given stage in evacuation; the availability of transport and the presence, quality, and length of metalled roads; the availability of premises for the accommodation of sick and wounded; the supply of stores and special equipment (surgical instruments, plaster-of-Paris, *x*-ray outfits, etc.); the season of the year and the state of the weather.

To carry out this system of treatment by stages during evacuation to a known destination it is not only necessary to maintain sufficient medical personnel, to render first aid, to give regular treatment, and to evacuate the wounded, but also efficiently to organize and control medical service, especially in the field. The removal of the wounded from the battle-field, the application of first aid, and primary treatment by a doctor are carried out by the forward field units of the Medical Corps, while qualified surgical treatment begins at the casualty clearing stations of army formations in the mobile field hospitals. The evacuation of sick and wounded, starting with the divisional casualty clearing stations, takes place through the medical units of army formations, on warrants issued by them. The slightly wounded that can be treated at the army base go immediately to special local hospitals; wounded needing specialized treatment are dispatched to field surgical hospitals; the sick go to therapeutic hospitals. Patients suffering from infectious diseases are isolated as soon as the diseases become known, and measures are at once taken to prevent spread of the infection; the isolated patients are then evacuated to special mobile field isolation hospitals. The system of evacuation of sick and wounded to a definite destination for qualified specialized attention provides the best possible conditions for their treatment and all the prerequisites for a rapid and complete recovery; it is at the same time a reliable means of combating mortality at all stages of evacuation, and greatly reduces later incapacitation from wounds.

The treatment of wounded at the various stages of evacuation can be carried out only when the medical service is well organized and equipped. An important factor in this respect is the correct distribution of available beds among field, base, and rear hospitals, due attention of course being paid to specialization within each zone. Our war experience has taught us that the number of hospital beds in field, base, and rear-area hospitals depends directly on the nature of operations and the general situation at the front. During the first phase of the war, for example, when our troops were withdrawing under enemy pressure, the situation demanded that the minimum number of beds be retained in the field and base hospitals. When the Red Army assumed the offensive and the rate of advance to the west quickened, it became necessary not only to make a great increase in the number of beds in field and army base hospitals but also greatly to augment the number of hospital units in these areas.

In carrying out the treatment and evacuation of wounded there are four main points on which success or failure of the system depends. First, the correct diagnosis of wounds and the proper classification of wounded at all stages of evacuation; secondly, the presence of a network of specialized hospitals at army bases and their correct clearing in the general directions of evacuation; thirdly, precision work on the part of transport and the organization of clearing centres, which ensure the rapid dispatch of wounded to the next stage; fourthly, the manœuvring of available hospitals, transport, and reserves in accordance with changes in the military or medical situation.

Principles of Organization of Anti-epidemic Work

Experience has shown that in all wars infectious diseases are a serious danger to troops in the field. The Red Army Medical Corps therefore employs a carefully planned system of anti-epidemic measures. Among the prophylactic measures adopted the most important are: constant strict medical control regarding the observation of all rules of hygiene, including personal hygiene, feeding, water supply, and billeting of troops; the systematic inspection by sanitary personnel of the territory occupied by the troops, including bath-houses, sources of water supply, slaughterhouses, bakeries, etc., and the medical inspection of the civilian population; the constant and careful sanitary reconnaissance of new areas occupied by the troops in the course of battle; prophylactic treatment of troops against possible epidemics, and the search for, registration of, and systematic treatment of chronic sufferers and carriers; extensive sanitary instructional work as a means of educating the troops and bringing about their participation in active anti-epidemic measures. On the outbreak of infectious disease the anti-epidemic measures employed include the immediate segregation of the patient for his later admission to an isolation hospital, and the disinfection of his quarters and all those who have had contact with him.

In the event of the discovery of a nidus or an outbreak of any epidemic disease it is most important that all the means of combating epidemics, including isolation hospitals, should be immediately transferred to the scene of the outbreak. In practice in the Red Army, when a nidus of infection is discovered the mobile isolation hospital and other anti-epidemic units are at once dispatched to the place where the patients are concentrated. The Medical Corps is specially equipped for the carrying out of extensive anti-epidemic measures. Depending on the general military situation and the nature of the epidemic, laundry and bath-house units, etc., are allotted to the troops in the forward positions; or in cases of necessity the existing sanitary units are strengthened by disinfection companies, mobile sanitary-epidemic units from the base, etc.

The freedom of troops from epidemic diseases depends to a considerable extent on the timely sanitary reconnaissance of the territory liberated and the medical inspection of its civilian population. The Red Army Medical Corps therefore undertakes anti-epidemic work among the civilians of liberated areas as well as among the troops. The collection and analysis of data on the health of the troops and the general state of the territory occupied by them and in which they will operate, and the carrying out of necessary prophylactic measures against infection and to eliminate nidi within the army area, are done under the direction of the Army Sanitary-Epidemic Unit, which has special sections attached to the various army formations.

The system of anti-epidemic work among the troops is effected through the following urgent measures. First, sanitary reconnaissance is carried out uninterruptedly, and includes not only the zone in which the troops are actually quartered at the moment but also the area in which it is assumed they will operate when they advance; secondly, a report is made at once to every branch of the medical service concerned, and first and foremost to the immediate superior, of the discovery of all foci of infection, or of anything which may affect the troops' freedom from infectious diseases. The timely reporting of such occurrences makes it possible to take into consideration the slightest change in the epidemic situation, to adopt the necessary prophylactic measures, and to mobilize rapidly all means for liquidating the epidemic danger that has been discovered.

Thirdly, we have the careful planning of anti-epidemic measures based on the tasks to be accomplished by the troops, the analysis of information provided by sanitary reconnaissance, and the general situation with regard to epidemic diseases. The plan must include the constant and strict control of all objects of significance from the standpoint of infectious diseases; the dispatch of anti-epidemic equipment in directions where concentrations and movements of troops are in progress and also to points where there is a danger of an epidemic outbreak; the maintenance of reserve equipment to strengthen forward sanitary units and neutralize the sudden outbreak of epidemics; and the working of the anti-epidemic service at definite stages of an engagement

Fourthly, the constant readiness and perfect mobility of anti-epidemic units are always borne in mind, with the rapid manœuvring of all available personnel and equipment to suit changes in the military and the sanitary situation; and, fifthly, we carry out the careful simultaneous mass application of all forms and methods of prophylaxis and anti-epidemic measures.

The entire freedom of the Red Army from epidemic disease has been achieved by the simultaneous and correlated activity of all units concerned, and is due to the fact that anti-epidemic measures among the troops are not carried out by individual specialists but by the Medical Corps as a whole. The absence of any serious or lengthy outbreaks of infectious diseases in the Red Army despite the extraordinarily unfavourable conditions which it meets with in its advance to the west lead us to assume with confidence that the anti-epidemic measures adopted are adequate and are fully abreast of the achievements of modern science.

In the course of the war fresh contingents of doctors and nurses have come into the Red Army, and extensive and valuable experience has been gained. The high level of medical service is ensured by the fact that the whole Red Army Medi

cal Corps, from general to private, is being systematically trained to improve military and medical knowledge, and is studying the new experiences which have been gained. For this purpose all medical units in institutions run planned courses of instruction; short courses for medical personnel are arranged to improve their knowledge of special branches; and numerous conferences of surgeons, physicians, epidemiologists, and workers in other specialties are held at which the experiences of the most progressive specialists and institutions are studied, summarized, and popularized.

Conclusion

The organization of the Red Army medical service does not stand still, but by the correlation of war experiences and study of the latest achievements in war medicine, its personnel and their distribution, the forms and methods of work are constantly being perfected. This is a guarantee that the Red Army Medical Corps will in the future be able to cope with the tasks with which it is faced.

TREATMENT OF GUNSHOT FRACTURES OF THE EXTREMITIES IN EVACUATION HOSPITALS OF THE U.S.S.R.

BY

Prof. NIKOLAI N. PRIOROV

In wartime the treatment of bone injuries has exceptional significance. According to data from Soviet hospitals fractures of the extremities constitute 38% of all wounds encountered during the present war. If fractures of the skull, face, spine, and ribs are added to this figure the total reaches 45 to 47%, or almost half of all wounds incurred at the front. Correct fracture treatment must involve not only restoration of lost function but restoration of fighting capacity as well and the return of an experienced and tried soldier to the Army.

Wartime gunshot fractures have these features:

1. They are open, compound, and complicated by infection.
2. Like closed fractures, they are accompanied by displacement of bone fragments.
3. They are associated with extensive destruction of soft tissue, not observed in closed fractures.
4. They are often encountered as comminuted fractures, with a large number of splinters scattered throughout the area surrounding the wound.
5. Wounded men with bone fractures are unavoidably subject to many-staged treatment in various stations and centres, beginning with field hospitals and ending in the deep rear.
6. Treatment is protracted and the results are less satisfactory than in treatment of closed fractures.

Principles of Treatment

Treatment of gunshot fractures in the U.S.S.R. is based upon the following principles: (1) First aid is administered on the battlefield at the spot where the wound is incurred, either by sanitary instructors or occasionally by other soldiers. (2) An aseptic dressing is applied to the wound and the limb is immobilized with splints made of plywood, bark, or wire netting. (3) Surgical débridement is performed at the first field medical stations.

Through-and-through wounds, with perforations of soft tissue at the sites of entry and exit, are always treated with antiseptics. The wound is always excised if there is extensive destruction of soft tissue. All devitalized and necrotic tissue is excised. Supplementary excision is performed in the presence of pockets or if an outpouring of lymph into spaces is likely. When the wounded man has not been treated for 24 hours after injury the wound is merely incised, and excision of devitalized tissue is carried out if necessary.

In treating the wound free bone splinters are removed and the periosteum is preserved; the wound is never sutured. Sulpha drugs and, more recently, penicillin are utilized. Reduction of the fracture is considered obligatory.

The following rules are observed in fracture reduction: (1) The fracture must be reduced at the earliest possible moment. (2) Reduction must be performed under general or local anaesthesia. (3) Reduction must be by manipulation or with the help of special orthopaedic tables and traction apparatus. (4) After reduction the position of the fragments must be verified by radiographs or by comparative measurements of the extremities. Plaster cast, Cramer, and Thomas splints and the Dieterich wooden splint are used for fixation of the extremities after surgical treatment. Cramer splints are preferable for injuries of the upper extremities; plaster cast or Thomas splints for injuries of the lower extremities.

Plaster casts are most often used, and are applied without cotton inner padding. Practice has shown not only that they effectively immobilize the fracture but that they are very effective in draining wound seepage. They keep the wound undisturbed and prevent secondary infection. The patient wearing a plaster cast must receive careful attention. High temperature, complaints of illness, pains in the extremities, all stress the necessity for examination and observation of the wound either by means of cutting a window in the cast or, occasionally, by removing the cast completely. Closed plaster casts must not be used if the presence of gas infection is suspected or if there is a possibility of haemorrhage.

Blood transfusion is widely used in treating shock and loss of blood. All wounded men receive antitetanus serum, and anti-gas-gangrene serum is also given in the presence of extensive and severe injuries to the tissue. The wounded, if transportable, are evacuated to rear hospitals by ambulance, hospital train, and aeroplane.

A network of special hospitals has been established for treatment of gunshot bone fractures. Distribution of the wounded among these hospitals is based upon the severity and location of their wounds. For those with slight injuries of the fingers, wrist, forearm, and foot there is a special hospital where they can simultaneously receive surgical treatment, physiotherapy, gymnastics, and occupational therapy. A separate hospital also exists for patients with injuries of the thigh, lower leg, and upper arm. This system makes possible correct allocation of requisite apparatus to the various hospitals, and also facilitates the assignment of cadres of specialists. It enables doctors and nurses working with a uniform contingent of wounded men to master more speedily the correct methods and technique of treatment.

Treatment in Base Hospitals

Patients arriving in base hospitals are subject to careful observation, which includes *x* rays, laboratory analysis of blood and urine, and bacteriological examination if necessary. If phlegmon or inflammatory processes exist in the region of the injury, especially when primary débridement has for some reason been omitted, secondary excision of the wound is performed. A wide incision is made and foreign matter, free bone splinters, and necrotic tissue are removed. Reduction is carried out simultaneously if the condition of the patient permits, the fragments being brought into juxtaposition and occasionally even fixed by suturing. Such delayed reductions are performed as late as four and even five months after injury if there is extensive displacement of bone fragments and union has not been secured. The wound is not sutured after secondary surgical débridement and late reduction; it is tamponed and commonly treated with antiseptics (including sulpha drugs and penicillin). Our observations enable us to recommend delayed reduction to surgeons with sufficient experience. In most cases extremely good results have been noted after these operations. A flare-up of infection occurs as a rare complication in individual cases.

Two methods are used for the treatment of gunshot wounds in rear hospitals: (1) the plaster cast and (2) skeletal traction. The plaster cast is employed in treating fractures of the upper arm, forearm, foot, and lower leg, and in all cases in which complications occur during the course of illness. In most instances closed plaster casts, in which openings have been made as a precautionary measure, are employed. Skeletal traction is used in fractures of bones of the thigh, lower leg, and upper arm, in the presence of displacement, and when complications are absent or have already been overcome, as well as in closed fractures. Thus, plaster cast and skeletal traction are not mutually exclusive but, on the contrary, supple-

ment each other. In certain cases treatment begins with the closed plaster cast and concludes with skeletal traction; in others it begins with skeletal traction and concludes with the closed plaster cast.

In gunshot wounds union is protracted. To stimulate this process we make wide use of physical therapy, quartz, paraffin, and ozocerite, as well as the antireticular cytotoxic serum of Prof. Bogomoletz and the tissue therapy of Prof. Filatov.

Considerable importance is attached to good nutrition and the prescription of vitamins. At the earliest moment that the patient's health permits, general and specialized physiotherapy (gymnastics) are used in order to improve his general condition and prevent muscle debility, contractures, and limitation of joint mobility.

Complications

A variety of complications may occur in the treatment of bone injuries. These include: (1) abscess, phlegmon, pus pockets; (2) osteomyelitis; (3) haemorrhage; (4) delayed consolidation, non-union, and pseudarthrosis; (5) malunion; (6) contractures, limitation of mobility, and ankylosis of joints; (7) sepsis. Each of these complications demands timely discovery, diagnosis, and special treatment.

Conclusion

We consider that considerable success has been achieved in our treatment of gunshot fractures. More than 50% of our wounded with bone injuries are returned to the Army. Complications in wounds of the thigh and lower leg have sharply decreased and the number of amputations considerably diminished.

AMPUTATION OF THE EXTREMITIES, AND PROSTHESIS, IN THE U.S.S.R.

BY

Prof. NIKOLAI N. PRIOROV

In gunshot wounds, amputation of the extremities is in many cases the sole means of saving life. In comparison with previous wars the number of amputations in the present war, both in the rear and at the front, has diminished by half. The reasons for this decrease are as follows: (1) approximation of surgical aid to the wounded; (2) application of first aid soon after injury; (3) radical excision of the wound in medical sanitary stations near the front and in field hospitals; (4) the use of antitetanus serum in all cases of trauma and of anti-gas-gangrene serum in cases of severe trauma; (5) wide use of sulphonamide preparations; (6) employment of blood transfusion, without exception, where indicated; (7) the possibility of retaining patients with severe wounds of the extremities in front-line hospitals until their condition becomes less grave; (8) complete immobilization of the injured parts.

We consider the plaster cast the best method of immobilization. The majority of amputations are performed at the front, and only an insignificant number—approximately one-fifth of all amputations—are carried out at hospitals in the rear.

Reasons for Amputation

The first and chief reason for amputation (up to 40%) is severe destruction and crushing of soft tissue, bones, and joints, with acute disturbance to nutriment of the extremities. The second reason is the tearing away of an extremity by shell fragments, bombs, etc., the remaining part being connected to the body by a mere patch of skin, thus necessitating only completion of amputation. Third, the presence of sudden and rapidly developing gas infection when other methods of controlling it are unsuccessful. Fourth, gangrene of the extremities, after injury to the blood vessels, burn, freezing, etc.: amputations of this type are not numerous (from 1 to 2% of the total). Fifth, the septic condition of the patient after trauma of the extremities, in the presence of phlegmon and purulent pockets, and in acute osteomyelitis, when all methods of treatment prove unsuccessful and it becomes necessary to sacrifice the injured part. Amputations as a result of these conditions constitute, according to our data, 7 to 9% of the total. They are performed in hospitals close to the rear.

Methods of Amputation

We use both chop and guillotine methods, but greatly prefer the latter because enough skin is saved to allow of a later skin graft. In individual cases we cut out one or two skin flaps, which, if conditions are favourable, can later be used to close the amputation wound. In order to protect the flap from infection it is rolled into tube form and sutured. Primary amputations are never sutured.

We consider the following safeguards obligatory in amputation: (1) To prevent the patient from becoming chilled during the operation and to provide him with heat (warm blankets, heat pads, etc.). (2) To give blood transfusions before and after operation. In primary amputation blood is transfused in large quantities; in secondary amputation it is transfused in small quantities. (3) To apply a tourniquet during the operation and not to lose a single drop of blood. (4) To operate under anaesthesia. We commonly use inhalation, intravenous, and local anaesthesia, and also freezing. (5) Observation and care, in the field hospitals where the amputation is performed, for a period of two or three days after operation.

Treatment of Stump

The reason for amputation, and the methods of amputation just indicated, determine subsequent treatment of the stump. An infected stump is never sutured. When it progresses favourably we recommend an initial dressing on the eighth or tenth day, preferably under anaesthesia. In such cases the amputation site is usually clean and covered with fresh granulation tissue, and inflammation is absent. Secondary suture, preferably with the use of plastic buttons, is possible, the edges of the wound being gradually approximated by tightening the suture. These measures guarantee a good stump for prosthesis and preclude the necessity for re-amputation.

When the stump does not progress favourably, owing to the presence of infection—phlegmon, osteomyelitis, phlebitis, etc.—the wound is treated by the usual surgical measures: supplementary excision, antiseptics (sulphonamide preparations, penicillin, gramicidin, bacteriophage, and others), and also by physiotherapeutic methods. The stump wound is treated with the aid of a Thomas brace in order to prevent the development of contractures.

A significant number (up to 80%) of amputation stumps are diseased or defective. Diseases of the stump comprise non-healing wounds, ulcers, osteomyelitis, ligature fistula, exostosis, neuritis, pains in the stump, phlebitis, disorders of the skin, and contracture. Defects of the stump consist of excessively long or short stumps, disarticulated stumps of the knee-joint, ankle-joint, wrist, and shoulder, stump scars with bone adhesions, conical stumps, ankylosis, and defects following osteoplastic operations.

In treating diseases of the stump and to remove defects physiotherapy, heat, mud, tar, paraffin, and ozocerite are extensively used. Cases that do not respond to conservative treatment are dealt with as follows: (*a*) by skin grafting; (*b*) by grafting adjacent tissue; (*c*) by excision of scar tissue, with skin grafting; (*d*) by removal of adhesions and ligatures; (*e*) by removal of neuromas and neurolysis; (*f*) by sequestrectomy; (*g*) by re-amputation.

Re-amputations form from 40 to 60% of all operations on the amputation stump and need special attention. The three chief points arising with regard to re-amputation are: (1) indications for re-amputation; (2) time of re-amputation; (3) method of re-amputation. According to data compiled during the war by Soviet hospitals, indications for re-amputation have occurred in the following proportions: non-healing wounds, up to 60%; osteomyelitis, from 17 to 20%; extensive scars with bone adhesions, 10%; exostosis, pains, etc., 10%.

The time for re-amputation can never be a matter of indifference. From a wide experience we have reached the conclusion that the ideal time is the third month after primary amputation, when good granulation tissue exists, inflammation and oedema have disappeared, and dense scars are not present. In cases of gas infection re-amputation is delayed until the six to tenth month.

The bone, in re-amputation, is dealt with by the Bunge method. The bone canal is tamponed with a section of muscle, bleeding vessels are carefully tied, the nerve is cut at a fairly high level with a razor blade, and drainage tubes are inserted for one day. The use of the osteoplastic operations of Pirogov, Bier, Gritti-Stokes, and Kirschner is widely recommended.

Preparation of Stump for Prosthesis

From the very beginning of treatment very careful attention is given to the preparation of the stump for prosthesis. In the first stage of stump treatment binding scars, contractures, and limitation of motion must be prevented. In the second stage, after the wound has healed, physiotherapeutic methods of treatment are used; these include massage of the extremities—omitting the stump itself—contrast baths, and electric stimulation. Stump exercises and gymnastics for the amputee, stump-wrapping, and training to accustom the stump to withstand pressure are started early, and therapeutic prostheses are extensively used. Stump preparation continues for two to three months.

Organization of Prosthesis Supply

In the Soviet Union a network of special hospitals have been established for the purpose of supplying prostheses. Each hospital includes a department of orthopaedics where the stump is treated, a department of physiotherapy where it is prepared for prosthesis, and a prosthesis department where the artificial limbs are completed and fitted. Our prostheses are made of wood, leather, or emolyten, and in the main our system of supply is divided into two sections—the manufacture of parts and the assembly of the finished limb. Several factories exist for the manufacture of unassembled metal and wooden limbs. Assembly of the prostheses is done by regional workshops distributed throughout the Soviet Union.

Special attention is given to supplying prostheses for wounded men with bilateral arm amputations. Either a Krukenberg operation or phalangization is performed, and the amputee is provided with an active artificial hand.

A healed amputation stump and a suitable prosthesis are essential for re-establishing the patient's working capacity and providing him with employment. Up to 90% of our amputees, after being treated and supplied with artificial limbs, return to the factories, plants, and other establishments where they were employed prior to the war. Only work can complete their rehabilitation; only work can heal their severe psychic wounds and restore their shaken nerves.

OSTEOPLASTIC RE-AMPUTATION OF THE THIGH

BY

Dr. ALEXANDER KOTOV

Many surgeons in the U.S.S.R. and in other countries consider end-weight-bearing stumps preferable to other types from the prosthetic point of view. These permit an artificial limb to be lighter in weight and simple in construction, and in addition they guarantee stability in walking, due to the fact that the amputee in a way "feels the earth under his feet." Non-end-weight-bearing stumps in many cases involve permanent pressure on the tuber ischiadicum, which is difficult to support and which hampers walking.

The objections raised by critics of end-weight-bearing stumps lie not in their disagreement with what has just been stated but basically in that in course of time the supporting capacity of the stump lessens and even completely disappears. It seems to us, however, that this does not justify depriving the amputee of the possibility of using an end-weight-bearing stump, even if only for a limited period.

End-weight-bearing Stumps

We consider that below-knee amputations provide the best means of obtaining end-weight-bearing stumps by operative procedure. According to our observations in the Soviet Union, the Pirogov, Syme, Bier, and Kirschner operations all give excellent results. Because of this they are widely used in our hospitals in cases requiring below-knee re-amputations. It was possible, by use of the methods mentioned, to provide the majority of patients with prostheses that reached no higher than the level of the knee-joint.

In re-amputation of the thigh there is less possibility of securing end-weight-bearing stumps. The Gritti-Stokes osteoplastic amputation, in the opinion of various authorities and according to our own observations, gives a good end-weight-bearing stump in the region of the lower third of the thigh. Some writers claim that they get a stable end-weight-bearing stump in the middle third of the thigh by that method. Conditions of war, however, especially in amputation centres, limit the use of this operation, both for thigh and for below-knee amputations. It is first of all excluded when thigh stumps do not include the patella; and, secondly, its use is seldom indicated on stumps of the upper third of the lower leg. Thus, in thigh re-amputations we do not regard the osteoplastic operation as an accepted method of securing an end-weight-bearing stump.

On the basis of data gathered from all hospitals under the control of the People's Commissariat of Health of the U.S.S.R., the number of thigh amputations following war trauma is approximately equal to the number of below-knee amputations. They constitute, however, a far more difficult group with respect to restoration of lost function.

Owing to the absence of two groups of major joints a thigh case finds walking much more difficult than a case with amputation of the lower leg. In addition, the surface that can be utilized to fasten the socket of the prosthesis is only one-half or one-third of that available in below-knee amputations. Finally, in non-end-weight-bearing stumps of the thigh the only anatomical point of pressure in walking with the prosthesis is the tuber ischiadicum. We are in agreement with those who, having observed the prostheses of patients with thigh amputations, point out that their adjustment to weight-bearing on the tuber ischii is often a lengthy and unpleasant procedure.

These factors forced us to seek a means of alleviating the condition of this group long before the outbreak of the present war. At the clinic of the Ukrainian Institute of Orthopaedics and Traumatology in Kharkov physiotherapeutic methods of accustoming the thigh to pressure after re-amputation were employed. Our observations showed that to secure an end-weight-bearing thigh stump by means of this method long and unwearying persistence was required, but the results completely justified the effort.

As a result of his training the patient with an end-weight-bearing thigh stump showed incomparably greater stability and ease in walking than when he had a non-weight-bearing stump. In addition the majority of amputees, after therapeutic treatment, began to walk with a mobile artificial knee-joint and refused to wear a lock, which they had previously insisted upon in order to prevent mobility. In some cases the end-weight-bearing stump enabled patients to abandon completely the use of the ischium for support.

During the war, which has made wide use of operative procedures for treatment of the stump possible, the idea arose of employing the osteoplastic method to increase the ability of the thigh stump to bear pressure. Our use of the Kirschner method for re-amputations of the lower leg in the amputee hospital at Seipolatinsk, Khazakstan, gave good results, and we decided to utilize the principle of this operation to obtain a pressure-bearing thigh stump. During ten months of work we performed 15 osteoplastic re-amputations of the thigh stump in the middle third. The post-operative wound healed very quickly in all these cases. We began educating the stump to weight-bearing on the twelfth to the fourteenth day after operation, exercising it a few times daily. At the beginning of the second month after operation the amputee was supplied with special crutches fitted with a platform for supporting the stump. The walking time was increased daily. Later this group of amputees were supplied with end-weight-bearing prostheses having free mobility of the knee-joint.

Technique

The technique we use in osteoplastic re-amputation is very simple. A flap of skin sufficient to cover the lower surface

of the stump is cut out on the anterior aspect of the thigh. The skin on the posterior surface is divided almost perpendicularly to the bone of the extremity. After this the muscle layers are divided conoidally and the bones of the thigh are sawn through. We saw off a ring-shaped bone transplant, 0.5 to 0.75 cm. thick, from the proximal end of the amputated bone and divide it into several sections. After appropriate modification the transplant is introduced into the bone-marrow canal, closing it. The muscles are then stitched in layers and the skin sutured. In some cases the diameter of the bone transplant enables us to fit it into the bone-marrow canal without division into sections, thus facilitating the operative technique.

Our observations relate to only a small number of cases and are too recent for definite conclusions to be drawn. Nevertheless the results have been so satisfactory that we feel justified in giving them wider publicity.

TRAUMATIC URAEMIA

BY

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(From an E.M.S. Base Hospital)

Just as the original draft of this paper was completed there appeared an article by Darmady and his colleagues (1944), writing from the R.A.F. casualty clearing station which feeds this E.M.S. base hospital. They described 8 patients who developed uraemia a few days after being wounded by high-explosive missiles. Oliguria and vomiting were constant features in these cases, and six of the patients died. Reference was made to similar cases described during both the present and the last war, but no mention was made of a paper on the subject by Duval and Grigaut (1918).

In the hope that further light may be shed on the mechanism responsible for the azotaemia two further cases are here reported. Both these patients were healthy young soldiers whose wounds caused such extensive muscle and vascular damage as to necessitate amputation; shock was severe and was treated by transfusion of blood and plasma; infection was well controlled by early surgery and the administration of penicillin and sulphanilamide. Uraemia developed rapidly and was undoubtedly responsible for the death of one of the patients, whose wounds were not sufficient in themselves to cause a fatal outcome. Looking back through our case records, it seems probable that other unrecognized examples of the condition may have passed through our hands.

Case I

Soldier aged 19. Penetrating wounds of both knees and left arm on Aug. 15, 1944; right popliteal artery severed. No note of tourniquet. Wound toilet and amputation through right knee 17½ hours after injury; B.P. 130/65, "not shocked"; A.T.S. 3,000 units; A.G.G.S. 10 c.cm. intravenously; 2 pints blood and 5 pints plasma. 660,000 units penicillin intramuscularly by Aug. 22; sulphanilamide 2.5 g., and sulphathiazole administered in unknown quantity.

Blood Counts of Case I

Date	R.B.C. (mill.)	Hb % (Sahli)	W.B.C.	Differential Count (%)							
				Neut. Poly. Seg.	Non.-Seg.	Metamyelocytes	Eosinophils	Basophils	Lymphocytes	Monocytes	Reticulocytes
Aug. 18	2·45	54									
,, 25	2·15	45	18,200								
,, 29	2·39	48	20,000								
Sept. 5	2·04	35	1,000								
	1·50	26	500	50			2		18	30	5
,, 6	3·36	64	1,620								
,, 7	3·16	57	1,450	18		36			32	14	
,, 8	3·46	61	3,600	12		38	2		24	24	
,, 9	3·52	74	5,500	24	36	10			16	14	
,, 12	2·68	54	9,800	59	20		1		12	8	
,, 18	2·76	55	10,000	78					16	6	
,, 27	3·14	52	14,200	71			1		22	6	
Oct. 12	2·66	38	15,000	79					12	9	
,, 25	3·65	68	8,100	70					24	6	
Nov. 13	4·40	78	8,200	68					22	10	
Dec. 19	5·24	94	10,000	61			2	1	32	4	

Aug. 18.—Mental condition disturbed; R.B.C. 2,450,000, Hb 54%. Severe mental confusion continued; psychiatric examination advised.

Aug. 25.—Admitted to this hospital (Mr. A. B. Watson). Still in similar state; completely disorientated, uncooperative and unable to understand questions; general condition poor; large sacral bed-sore. Wounds dressed under anaesthesia—clean. Unable to pass urine before going to theatre; 30 oz. of *normal* urine withdrawn by catheter. Hb 45% (record of blood counts in accompanying Table); 2½ pints blood given. Particulars of fluid balance summarized in Chart; the figures for the first 5 days are inaccurate, as he was incontinent, some specimens being lost.

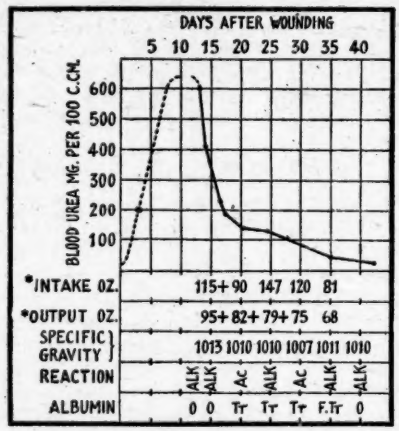

Chart showing details of fluid balance in Case 1.
* Average of previous five-days period.

Aug. 28.—Taking fluids well. Still drowsy, irrational, and incontinent. Respirations deep and slow; dry skin, fishy odour, and uraemic tongue. No oedema. Urine: Sp. G. 1013, alkaline, no albumin, no sugar, sulphanilamide crystals present. Blood urea over 600 mg. per 100 c.cm. (value approximate only at this level; subsequent determinations on Chart). It was discovered at this point that since admission the bed-sore had been dusted daily with sulphanilamide, and that sodium citrate 30 gr. t.d.s. had been given without instruction; both discontinued.

Aug. 31.—Rational and continent. B.P. 140/70. A few small haemorrhages and one white plaque seen in retinae; arteries of fundi a little prominent.

Sept. 1.—Urine: albumin and a few red cells; urea concentration normal. Running slight pyrexia due to low-grade infection of left knee-joint; amputation stump healthy.

Sept. 5.—Further course of penicillin started (650,000 units). Agranulocytosis noted; van den Bergh negative. Pentnucleotide 10 c.cm. 3-hourly and blood 4 pints, followed by rapid improvement in blood picture. The leucopenia was undoubtedly due to sulphanilamide absorbed from the bed-sore, for the blood sulphanilamide on Sept. 9 was 4 mg. per 100 c.cm.

Sept. 20.—Ocular fundi normal; B.P. 140/90; slight oedema of left leg, which subsided within 2 weeks.

Oct. 4.—Van Slyke's urea-clearance test, 94 and 108% of normal function; urea concentration normal.

Oct. 10.—Re-amputation of right femur and removal of foreign bodies from left knee. Considerably shocked; 2 pints blood given. Blood urea after transfusion, 27 mg. per 100 c.cm. Recovery rapid. Nocturia persisted until mid-October, but urine normal from Sept. 27. Subsequent course of illness uneventful.

Nov. 11.—Simple water dilution test revealed inadequate dilution and imperfect elimination of fluid. (50 oz. fluid given at 8 a.m. Total fluid passed between 9 a.m. and noon, 24 oz.; lowest Sp. G. 1010. Normal should exceed 50 oz., with dilution to 1002 or less.)

Nov. 13 and Dec. 5.—Simple water concentration tests showed defect. (Fluids restricted to 1 pint for 24 hours. Total output in the two tests, 12 oz. and 21½ oz.; highest Sp. G., 1024 and 1025. Normal less than 30 oz. and more than 1027.)

Nov. 15.—Excretion pyelography normal.

Case II

Soldier aged 25. On Nov. 4, 1944, sustained dirty wound of right arm, with extensive muscle damage, disorganization of elbow, and division of ulnar vessels and ulnar and median nerves. Tourniquet applied until arm was amputated at fracture site 5 hours later. Pulse 92; blood pressure unobtainable before operation. A.T.S. and

A.G.G.S. presumably given; 5 pints blood and 3 pints plasma. Penicillin administered locally and intramuscularly; total dose recorded 350,000 units, but was probably more. No record of sulphanilamide.

Nov. 8.—Stump satisfactory when dressed under anaesthetic; was unable to pass urine before operation.

Nov. 10.—Admitted to this hospital (Mr. Lionel E. Jones). General condition good; sutured amputation stump clean. Occasional hiccups. Intake 6 oz. Urine 14 oz., vomit 4 oz.

Nov. 11.—Still has hiccups; tongue dry; blood urea 500 mg. per 100 c.cm. R.B.C. 2,680,000, Hb 46%. Intake 77 oz. Urine 33 oz., vomit 28 oz.

Nov. 12.—Hiccups occurring with every inspiration; uraemic tongue; drowsy. Occasional twitching of left arm; C.N.S. normal, fundi normal. B.P. 170/70. Liver slightly enlarged. Stump clean; slight oedema of right shoulder. Considerable bruising and swelling left elbow region, probably due to leak from pentothal. Oedema of sacral region; no venous engorgement. Magnesium sulphate enema and morphine. Urine: neutral, Sp. G. 1012, albumin +, occasional R.B.C., no casts or crystals, spectroscopic examination normal, urea 1.8 g. per 100 c.cm., NaCl 0.12 g. per 100 c.cm., benzidine reaction negative. Intake 51 oz. by mouth, 20 oz. intravenous 5% glucose. Urine 70+ oz., vomit 3 oz. In evening developed pulmonary oedema. Retention of urine at 9.30 p.m.; catheterized. Died 11.15 p.m.

Necropsy 16 Hours After Death.—Amputation wound healthy; microscopical examination of muscle showed necrosis with recent haemorrhages and infiltration with polymorphs and lymphocytes, but no evidence of gas gangrene. Trachea contained frothy fluid; heavy waterlogging of lungs confirmed by microscopy; 1 pint clear fluid in right pleural cavity. Heart normal. Liver large and pale; the cells were separated by wide sinusoids and contained a few small fatty globules; some of the portal tracts contained phagocytic cells laden with brown pigment. Spleen, pancreas, suprarenals, and gut normal. Kidneys 8 and 8¼ oz., slightly oedematous, glistening and with well-defined markings; little fatty change seen microscopically; glomerular tuft congested but not grossly abnormal; some tubules were dilated and contained hyaline and granular casts staining orange with eosin, desquamated cells, wisps of hyaline material, occasional polymorphs, and phagocytic cells with ingested orange pigment. In addition a few crystals were seen in some of the tubules; they were grey in colour and spherical with radial striation; some were broken up into a mass of smaller crystals each resembling a small scalpel blade. Staining for free iron negative. In the interstitial tissue of the kidneys there were a few collections of lymphocytes, plasma cells, and eosinophils. Vessels normal. (Microscopical examination by Dr. J. L. Edwards.)

Discussion

It is obvious that in these patients the production of urea is more rapid than its elimination. In the great majority of recorded cases there has been severe damage to one or more limbs, often involving large vessels. Haemorrhage and shock have therefore been the rule and transfusion has invariably been necessary. Darmady and his colleagues (1944) have remarked that the condition is in some ways like the crush syndrome, and it should also be noted that it bears a resemblance to the azotaemia of haematemesis.

It was shown by Taylor and Lewis in 1915, and confirmed by many others since that time, that when bleeding reduces an animal's blood volume to about 50% of normal the blood urea rises. This increase may be considerably accentuated by repeated haemorrhage and by associated dehydration (Meyler, 1935). Wallace and Sharpey-Schafer (1941) were unable to demonstrate a significant rise of blood urea in blood donors unless there was a pre-existing renal defect.

Black (1942), in a full account of azotaemia in gastro-duodenal haemorrhage, points out that the condition is due to a functional renal impairment associated with accelerated breakdown of tissue protein, as well, of course, as absorption of nitrogenous material from the blood in the bowel. He goes on to say: "For the most part extrarenal azotaemia from whatever cause can be traced back to a reduced blood volume or disturbed water and salt metabolism, or both. Either of these primary causes can produce both increased protein katabolism and functional renal failure, and it is probable that both these secondary changes must be present before azotaemia develops." In traumatic uraemia, at any rate during the period immediately after wounding, the dietetic protein, 80 g. of which will raise the blood urea by about 50 mg. per 100 c.cm., can play little or no part as a source of urea; it must therefore be derived from tissue breakdown. The rapid rise of blood urea is consequently suggestive of an accelerated protein katabolism, especially when considered in conjunction with the speed at which weight is lost by these patients. There is no doubt that they all suffer from dehydration and oxygen deprivation due to anaemia, vasoconstriction, and reduced blood volume—factors quoted by Black as increasing tissue-protein katabolism. It is therefore probable that the manufacture of urea from tissue proteins is abnormally rapid after severe traumatic haemorrhage.

It is remarkable that the livers of these patients carry out their task so efficiently, since often there is evidence of hepatic damage. Some of the patients are jaundiced and changes in the liver cells are usually demonstrable at necropsy. The azotaemia of acute necrosis of the liver chiefly concerns the non-protein nitrogen other than urea, and if the blood urea is high, as sometimes happens in cases of carbon tetrachloride poisoning, renal failure rather than liver damage is responsible (Forbes, 1944). Incidentally Forbes mentions a case in which recovery of kidney function was complete 46 days after the urea clearance had been reduced to less than 10%.

As a normal kidney can rapidly clear large amounts of urea from the blood stream, there can be no doubt that impairment of renal function is the major factor in the production of traumatic uraemia. Darmady and his colleagues state that oliguria is always present, and this is certainly to be expected during the phase of haemorrhagic shock, for it has been shown that this state causes an active constriction of the renal arteries with consequent reduction in urinary excretion (Lauson *et al.*, 1944). Unfortunately no information is available about the urinary output of either of our patients during the immediate post-traumatic period, but the second patient was passing only small quantities when he first came under our observation. It is improbable that complete anuria persisted for more than a few hours at most, for such an event could scarcely pass unnoticed in a general hospital. The state of shock which might have led to cessation of urinary excretion was rapidly corrected by transfusion, but it has been shown that diminution of renal blood flow may persist after haemorrhagic shock even when the systemic blood pressure has been restored to normal by emergency measures (Lauson *et al.*, 1944). There is no evidence that the transfused blood was incompatible. The other possible causes of renal impairment tend to produce their effects after a few days' delay and do not satisfactorily explain the onset of symptoms so shortly after wounding. Sulphonamides, for example, when given in therapeutic doses are unlikely to damage the kidney sufficiently to suppress formation of urine until almost a week has passed. Likewise, after a crushing injury anuria is commonly delayed for several days, although it has been shown that injections of myotoxin will cause instantaneous anuria in rats followed, in non-fatal cases, by oliguria and eventually by diuresis (Bielschowsky and Green, 1943).

The diuresis present in the first patient was a stumbling-block to diagnosis. When a man is passing daily over 100 oz. of urine, in which no albumin or abnormal cellular elements can be found, it is unnatural to suspect that his blood urea is over 600 mg. per 100 c.cm. It will be observed that the second patient also developed a diuresis in the later stages and that the urea concentration was good; but despite this he retained fluid in the subcutaneous tissues and pleural cavity, and eventually died of pulmonary oedema. The diuresis was no doubt stimulated as much by the high blood urea as by the high fluid intake; a similar phenomenon has often been observed during recovery from the azotaemia of haematemesis, and during this stage there is no apparent abnormality of renal function. Darmady and his colleagues (1944) found that the defective urea clearance occurring during the early phases of traumatic uraemia became normal as the patient improved.

The renal function of our surviving patient was normal when examined by the generally accepted tests, and there was certainly nothing to suggest pre-existing kidney damage. Although the concentration of urea in the urine was usually low, no doubt because of the diuresis, Fowweather's concentration test was normal. Urea clearance (van Slyke) and elimination of uroselectan were also normal. It is therefore interesting and important that simple water dilution and concentration tests proved more sensitive in demonstrating a renal defect which

has persisted. When a large amount of fluid was drunk it was excreted too slowly and the specific gravity of the urine failed to fall as low as it should have done, indicating abnormal glomerular filtration. Neither did water deprivation raise the specific gravity to the levels which ought to have been reached—an indication of impaired tubular absorption.

The transient albuminuria in this case was almost certainly due to sulphanilamide poisoning: it coincided with the discovery of crystals and red cells in the urine and heralded the appearance of agranulocytosis. (Incidentally this emphasizes once again the danger of uncontrolled application of sulphanilamide powder to ulcers; the response of the severe leucopenia to massive doses of pentnucleotide is also worthy of notice.) If the albuminuria had been due to the effects of the original injury, as was presumably the case in the second patient, it should have been evident when the blood urea was at its maximum. During the post-traumatic period neither patient passed red cells in excess no casts were found, and spectroscopic examination for haemoglobin and muscle pigments was negative.

The kidneys of the second patient were examined post mortem and were similar to those already described (Darmady *et al.*, 1944), the pathological lesions being comparable to those of the crush syndrome and largely confined to the tubules. In addition a few sulphanilamide crystals were present. The changes were certainly insufficient to explain urea retention on the purely mechanical basis of tubular obstruction, and the glomeruli were comparatively healthy. The blood urea does not rise in nephrosis in which pathological changes are confined to the tubules. It therefore seems more likely that the cause of renal failure and of the damage to the tubules is anoxia resulting from vasoconstriction of the renal arteries during the stage of shock, aggravated by blood loss, a fall in blood pressure, and dehydration. This supposition is favoured by the demonstration of similar alterations in the tubules after temporary clamping of the renal vessels (McEnery *et al.*, 1927) and by the theory propounded by Maegraith and Findlay (1944) that peripheral vascular atony with redistribution of renal blood flow explains the suppression of urine in blackwater fever. The action of myotoxin may be accounted for in a similar manner. Oedema of the kidneys and rupture of some of the renal capillaries occur during the anoxic period, and may be responsible for the slow recovery of renal function after the systemic blood pressure has risen to normal.

It has not yet been decided how these cases should be treated. Arguing on purely theoretical grounds, which may be fallacious, the best hope of improvement should lie in the early restoration of an adequate blood flow to the kidneys. Caffeine is said to dilate the renal vessels, and although its effectiveness in these cases is doubtful it can certainly be administered in full doses without harm. Giving oxygen in high concentrations might also be of value, but there has been considerable disagreement about its success in the treatment of shock (*vide* annotation in the *British Medical Journal*, 1942). It would seem particularly important to raise the pressure, volume, and oxygen-carrying capacity of the blood to normal levels, and this can only be achieved by the continuous administration of carefully matched blood, and then with difficulty. Black and Smith (1941) have demonstrated that blood is much more effective than plasma in promoting the excretion of urea when azotaemia develops after haematemesis. Fluids should certainly be provided in abundance, but because these patients tend to develop subcutaneous and pulmonary oedema it should be given by mouth or by rectum and not intravenously.

Summary

Two further cases of traumatic uraemia are reported. It appears that the condition may be relatively common in modern warfare, especially when severe damage to a limb involves large blood vessels. Evidence is given that urea manufacture from tissue protein is increased in the early stages of the illness, and reasons are advanced in support of the view that urea retention is due to renal anoxia. It is suggested that blood transfusion should be the most important factor in treatment. During the recovery phase diuresis is pronounced and the usual renal function tests may show no abnormality. Simpler tests have revealed kidney impairment in one of the cases described.

One patient had severe leucopenia as a result of sulphanilamide poisoning, and responded rapidly to injections of pentnucleotide.

I am indebted to my surgical colleagues for permission to quote their cases, and to Dr. J. L. Edwards for the histological report.

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THE CEPHALIN–CHOLESTEROL FLOCCULATION REACTION AS A TEST OF HEPATIC FUNCTION

BY

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The cephalin–cholesterol flocculation reaction was first introduced by Hanger (1939) as a test of hepatic efficiency. It is recognized that many of the liver function tests in common use fail to detect early or mild liver damage; positive results are often found only in the advanced stages of the disease when clinical symptoms are already manifest. The cephalin-cholesterol flocculation test has been shown by several American workers (Hanger, 1939; Pohle and Stewart, 1941; Rosenberg, 1941; Nadler and Butler, 1942; Mateer *et al.*, 1942; Yardumian and Weisband, 1943) to be an extremely sensitive test in the early detection of hepatic insufficiency. The test was found to be of considerable value in prognosis in cases of acute infective hepatitis; the persistence of a strongly positive reaction indicates severe liver damage. A further important claim was its value in the differentiation of jaundice due to parenchymatous disease of the liver from that due to obstruction of the biliary passages. It therefore promises more diagnostic help than certain of the earlier tests, in which similar results are obtained in all types of liver disease.

The value of the cephalin–cholesterol flocculation test of hepatic function has not yet been conclusively established in this country. It falls into the category of empirical procedures rather than a definite test of any known hepatic function. The exact mechanism of the test is poorly understood (Hanger, 1939). It is relatively inexpensive to carry out; few reagents are required, and it is more easily performed than other tests in common use. The object of this paper is to present results of this test in hepatic and biliary disease; no attempt is made to explain the mechanism of the reaction.

Method

The method employed was that described by Hanger (1939). First, enough cephalin was obtained by extraction from sheep's brain to last for about one year. Sheep's brains (two or three) were dehydrated by three extractions with acetone, and the dry powdered tissue was three times extracted with ether. The ether extracts were concentrated and the crude cephalin was precipitated by the addition of four volumes of absolute alcohol. The resulting precipitate was dissolved in the minimum amount of ether; the accompanying cerebroside impurities were precipitated by chilling to 5° C. and removed by centrifugation. The supernatant ether solution was again precipitated with four volumes of absolute alcohol, chilled, and the precipitate filtered, washed with alcohol and acetone, and desiccated. The cephalin preparation is a brown powdery material. Hanger (1939) suggested that freshly prepared cephalin was too sensitive and that it should be ripened for some months before use.

A stock solution was then prepared by adding 300 mg. of cholesterol and 100 mg. of cephalin to 8 c.cm. of ether. This stock solution, well stoppered, was kept in a refrigerator at 0 to 5° C. In order to prepare the emulsion 35 c.cm. of distilled water was heated to 65–70° C., and 1 c.cm. of the stock

solution was slowly added, with frequent stirring. The emulsion was heated to boiling-point and allowed to simmer until the volume was reduced to 30 c.cm. This was cooled to room temperature, and 1 c.cm. of the emulsion was added to a centrifuge tube containing 0.2 c.cm. of the patient's serum and 4 c.cm. of freshly prepared 0.85% sodium chloride. The centrifuge tube was stoppered, shaken, and left at room temperature. After 24 hours note was made of the presence of flocculation, which was designated "zero" to "4-plus." The serum should be used immediately or else kept in an ice-box for not longer than 6 hours. The final reading should be made in 24 hours, as normal sera may cause positive flocculation in 48 hours (Clay and Moore, 1942).

Previous workers (Pohle and Stewart, 1941; Clay and Moore, 1942) showed that the test was positive in a small percentage of normal individuals and in those suffering from various systemic disorders. It therefore appeared necessary, in assessing the value of this test, to examine the sera of such individuals as well as the sera of those with definite hepatic disease. Accordingly the test was applied to the sera of three different groups: (1) Healthy individuals attending as blood donors. (2) Patients suffering from a variety of systemic diseases without clinical evidence of hepatic disease. (3) Patients suffering from hepatic or biliary disease.

Results

(1) Sera of Normal Individuals

The test was applied to 100 individuals attending as blood donors who were regarded as healthy. Only one of the 100 sera examined gave a positive reaction (4-plus) after 24 hours. This patient had a history strongly suggestive of a mild attack of infective hepatitis a few weeks previously; the serum gave an indirect van den Bergh reaction of 0.9 mg. per 100 c.cm. This case can therefore be excluded from the controls because there was evidence of hepatic disease; in 99 normal persons the test was negative.

(2) Sera of Those Suffering from a Variety of Systemic Disorders

This group includes 164 patients; 123 were in the wards, and 41 attended as out-patients on account of rheumatoid arthritis. The results are shown in Table I.

TABLE I.—*The Cephalin-Cholesterol Flocculation Test in Various Non-hepatic Diseases*

System Involved	No. of Cases	No. with Flocculation
Cardiovascular	14	0
Haemopoietic	17	4
Respiratory	17	4
Alimentary	29	2
Renal	8	1
Nervous	8	0
Endocrine	13	0
Bones and joints	58	2
Total	164	13

Table I shows clearly that flocculation may occur in those suffering from conditions not primarily hepatic. Positive reactions were encountered in 13 patients (7.7%), and details of these are shown in Table II.

TABLE II.—*The Disease and Degree of Flocculation in Cases with a Positive Reaction*

Case	Disease	Degree of Flocculation
1	Pernicious anaemia	++
2	Iron-deficiency anaemia	++++
3	Malaria	++++
4	"	++++
5	Lung cancer	+
6	Pleurisy with effusion	+++
7	Diaphragmatic pleurisy	+
8	Asthma	++
9	Diabetic coma	+++
10	Cancer of stomach (liver not involved)	+
11	Nephritis and haemolytic anaemia due to sulphonamide therapy	++
12	Rheumatoid arthritis	++++
13	" "	++++

Table II shows that the patients who had positive reactions suffered from very varied conditions; in 10 cases the reaction was strongly positive, whereas in 3 the degree of flocculation was slight. In most instances it is difficult to explain why positive reactions were obtained; in Cases 9 (diabetic coma) and 11 (nephritis with jaundice) it is not improbable that it should have been positive. Further liver function tests were carried out in many of the patients (Nos. 1, 2, 3, 4, 10, 11, 12, and 13), but revealed no evidence of hepatic inefficiency. Most patients were dismissed when the primary disease was cured without repetition of the test, but in Cases 1, 2, and 3 the reaction became negative before dismissal. In Cases 12 and 13 the test was carried out on numerous occasions and positive reactions were always obtained. Repeated biochemical investigations failed to show any evidence of hepatic disease in these two patients, and the cause for the positive flocculation could not be explained.

(3) Sera of Those with Hepatic or Biliary Disease

The majority of patients in this group were suffering from hepatitis—the test being performed either during the acute course of illness or in convalescence—or from biliary obstruction. A small number of patients suffering from cirrhosis or cancer of the liver are included because of the variable results of the test so far reported in these conditions. Lastly, the results obtained in 12 patients who developed jaundice during the course of arsenical treatment for syphilis are included in order that some light may be shed on the nature of the jaundice.

(*a*) *Infective Hepatitis.*—The sera of 38 patients suffering from infective hepatitis were studied. Twenty-six came under observation early in the course of the disease, and in several cases readings were obtained during the illness; in 12 other patients the test was performed after recovery from an acute attack, such patients reporting in convalescence.

TABLE III.—*Cephalin–Cholesterol Flocculation Test in Acute Infective Hepatitis*

Degree of flocculation	0	+	++	+++	++++
No. of cases	—	7	2	1	16

TABLE IV.—*Cephalin–Cholesterol Flocculation Test during the Course of Infective Hepatitis*

Case	Date	Degree of Flocculation	Case	Date	Degree of Flocculation
1	25/8/43	+++	15	18/2/44	++++
				15/3/44	++++
2	13/9/43	++++		27/3/44	++++
	21/9/43	++++			
	22/11/43	—	16	29/3/44	++++
3	13/9/43	+	17	26/5/44	++++
	21/9/43	+			
			18	16/6/44	+
4	21/9/43	++++		27/6/44	++
	24/9/43	+		7/8/44	++++
5	22/9/43	+	19	14/6/44	++++
				16/6/44	++++
6	12/10/43	++		19/6/44	++++
	16/11/43	—			
			20	22/6/44	++++
7	11/12/43	++++		27/6/44	++++
	12/12/43	++++			
			21	6/7/44	++
8	25/2/44	++++		8/7/44	+++
	28/2/44	++++		11/7/44	+
9	2/3/44	++++	22	6/7/44	+
	4/3/44	++		8/7/44	+
				11/7/44	—
10	8/3/44	+		20/7/44	—
	10/3/44	+		24/7/44	—
	23/3/44	—		27/7/44	—
				31/7/44	—
11	15/3/44	++++			
	21/3/44	++++	23	17/7/44	++++
	19/4/44	—		24/7/44	++++
				27/7/44	++++
12	13/4/44	+		31/7/44	+++
	18/7/44	—			
			24	2/8/44	++++
13	2/5/44	++++		5/8/44	++++
	5/5/44	++++		11/8/44	++++
	9/5/44	++++		15/8/44	+++
	15/5/44	++++		21/8/44	+++
	30/5/44	—			
			25	4/8/44	++++
14	26/8/43	+		8/8/44	++++
	21/4/44	++		10/8/44	+++
	7/6/44	+		14/8/44	—
	6/7/44	+		17/8/44	—
	24/7/44	++++		21/8/44	—
			26	15/8/44	+++
				21/8/44	++++

In every case of acute infective hepatitis the test was positive; in all but 7 cases it was markedly positive. The test is therefore a sensitive one in the detection of parenchymatous liver disease, for in a few patients the symptoms were mild and the degree of jaundice was slight, yet positive results were obtained. A further important use of the test, previously stressed, is its value in prognosis. This is illustrated by Table IV, which shows the results obtained during the course of the illness in patients observed during the acute stage.

It was found that the results of the cephalin–cholesterol flocculation test run parallel with the clinical severity of the disease and with other tests of hepatic function (serum bilirubin, laevulose-tolerance test, and hippuric acid synthesis test); with severe hepatitis, flocculation was most pronounced. Patients Nos. 14, 15, 18, and 19 died. In Cases 15 and 19, 4-plus readings were present throughout the illness, while in Cases 14 and 18 the test remained positive for a considerable time, and before death 4-plus reactions were recorded. In the 12 patients who had recovered from jaundice the test was negative in 10 and positive in only 2. These two patients clinically had a fairly severe attack of hepatitis, and although other tests showed liver function to be within normal limits the cephalin–cholesterol flocculation test was still positive.

(*b*) *Obstructive Jaundice.*—Fifteen patients were included in this group; the nature of the obstruction, the reason for this diagnosis, and the results of the tests are shown in Table V. In several cases the test was repeated but no change in the degree of flocculation was noted, so only this is included.

TABLE V.—*Cephalin–Cholesterol Flocculation Test in Obstructive Jaundice*

Case	Nature of Obstruction	Reason for Diagnosis	Degree of Flocculation
39	Cancer of bile duct	Operation	—
40	Gall-stones	,,	—
41	Cancer of pancreas	Clinical	—
42	,, ,, ,,	,,	++++
43	,, ,, bile duct	Necropsy	—
44	,, ,, ,, ,,	,,	—
45	,, ,, pancreas	Operation	—
46	,, ,, bile duct	Necropsy	—
47	,, ,, pancreas	Operation	—
48	Gall-stones	,,	—
49	,,	,,	—
50	,,	Clinical	—
51	Cancer of pancreas	Operation	—
52	Gall-stones	Clinical	—
53	Post-operative stricture of common bile duct	Operation	—

Only one of the 15 patients in this group gave a positive reaction; in this case, unfortunately, the diagnosis rested solely on clinical examination, which, however, was fairly conclusive. The jaundice was of long duration and there was undoubted damage to liver cells. This patient died in his own home soon after dismissal.

(*c*) *Cirrhosis of Liver; Cancer of Liver.*—It is often difficult to be sure of the diagnosis of hepatic cirrhosis, but in the 9 cases in this group the diagnosis seemed fairly certain clinically or was confirmed by biopsy; in all 9 patients other liver function tests had indicated hepatic inefficiency. In 3 of the cases the test was positive, in 2 strongly so. In 3 patients with secondary cancer of the liver (confirmed in two by necropsy) the test was negative. In 2 other patients, in whom the diagnosis of cancer of the liver was made on clinical grounds, a 2-plus reaction was obtained in one case and a negative result in the other. Both cases showed evidence of hepatic inefficiency as judged by other liver function tests.

(*d*) *Arsenical Hepatitis.*—The test was performed in 12 patients who developed jaundice during the arsenical treatment of syphilis. The present paper does not permit of a full analysis of these arsenical jaundice cases, such as the relationship of the jaundice to the course of arsenical, its duration, and the presence of other toxic manifestations of arsenic. Of the 12 sera examined 7 gave a positive result, 5 of them strongly positive; in the other 5 cases there was no flocculation.

Discussion

The results obtained agree very closely with those of American workers. In normal healthy individuals the test is always negative when read at 24 hours. The tests were also read at 48 hours, when 13% of normal healthy individuals gave a positive reaction (1-plus or 2-plus). In carrying out this test it is therefore necessary to read the degree of flocculation after 24 hours. With the same cephalin reagent the test was carried out in normal individuals at two different periods separated by 4 months, and there was no significant difference in the number of positive reactions obtained at these times. The degree of ripening of the cephalin appears to have no great influence on the sensitivity of the reagent.

In the patients who suffered from conditions not primarily hepatic the positive results are difficult to explain; such patients did not fall into any special category of illness. A fairly complete biochemical analysis of many of these cases was carried out (serum bilirubin, laevulose-tolerance test, hippuric acid test, plasma proteins, N.P.N., and cholesterol), yet no explanation of positive flocculation could be found. In such patients the liver involvement is an incident in the primary disease, and it is only in biliary obstruction that difficulties in the interpretation of the test are likely to arise, but these can usually be eliminated by other means.

In acute infective hepatitis the test was positive in 100% of the cases. The degree of flocculation bears a definite relation to the severity of the illness. In severe cases of hepatitis 4-plus reactions were always obtained; a lessening in the degree of flocculation was a good prognostic sign, while a continued 4-plus reaction was often associated with death. The speed at which flocculation occurred also paralleled the severity of the disease; in two patients who died flocculation was noted as early as two hours after setting up the test. In convalescence the disappearance of flocculation should be hoped for; a continued positive reaction in two fairly severe cases suggested that there was residual liver damage.

In contrast with the positive flocculation always obtained in infective hepatitis, only one case (6.6%) of obstructive jaundice gave a positive result, and in this patient the jaundice was of long duration. Obstructive jaundice which is likely to be relieved by operation is nearly always associated with negative flocculation. The cephalin–cholesterol flocculation test is therefore of considerable value in the differentiation of these two types of jaundice; it was much more helpful than the van den Bergh test, the laevulose-tolerance test, or the hippuric acid synthesis test.

The cephalin–cholesterol flocculation test seems to offer much less help in patients suffering from cirrhosis or cancer of the liver than in jaundice due to acute infective hepatitis or obstruction of the biliary passages. In cirrhosis the reaction was stated by Hanger (1939) to parallel the activity of the pathological process. If a negative result is obtained then residual scarring would appear to be the sole pathological lesion. In metastatic cancer negative flocculation is usually encountered unless the process is severe, while in primary cancer positive results are usually obtained.

The results of the test in cases of arsenical jaundice are interesting. They agree closely with those of Hanger and Gutman (1940), and suggest that the icterus which follows the administration of an arsenical is not always due to parenchymatous damage, but may be caused by an obstructive process within the biliary passages. It is clear that the jaundice which develops in such patients differs from that of infective hepatitis. The cephalin–cholesterol flocculation test would therefore be of no value as the routine test in the early detection of liver damage in patients receiving arsenical treatment for syphilis.

Summary

The cephalin–cholesterol flocculation test is an entirely empirical reaction, but is simply carried out and appears to be of value as a test of hepatic efficiency.

Positive flocculation occurs in the presence of parenchymatous disease of the liver, and the degree of flocculation runs parallel with the severity of the case. A persistently positive flocculation is an unfavourable sign.

The test is of value in the differentiation of jaundice due to infective hepatitis from that due to biliary obstruction.

It is useless as a test in the early detection of liver damage in arsenical jaundice.

The test is positive in a small number of patients whose illnesses are not known to affect the liver; in normal healthy individuals, however, it is always negative.

From my experience the test is of definite value, even although its mechanism is not understood.

I wish to thank Prof. J. W. McNee for his helpful advice and criticism, and Dr. J. B. Rennie for the results of other liver function tests in the cases under review.

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EMPLOYMENT OF THE POST-NATAL WOMAN

BY

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It seemed proper that, as a sequel to our article on "Employment of Pregnant Women in Industry" (*Journal*, 1944, **1**, 108), we should follow these cases up and show how the women return to work after their confinements. We have done this in the 90 cases of the original article, and 40 others, up to 17 months after delivery.

Return to Work after Confinement

In our last follow-up of the original patients, in Feb., 1944, only 61 of the 90 mothers could be communicated with owing to change of address, evacuation, etc. The striking fact was that only 14 out of the 61 had returned to work at all, and only 4 at the end of four months after delivery. Two returned one month after the baby was born: one of these, a multipara with several children, had to do so for financial reasons, and her own mother looked after the baby. The other had a stillborn child. Two returned at two months: one of these was a single girl whose baby had been adopted; the other had lost her baby at birth. Four returned at three months. One of these had a premature stillbirth, the second arranged for the baby to be looked after by a neighbour, the third had her baby cared for by her mother, and the fourth took her baby to a day nursery. One returned at four months, her baby being cared for at a day nursery. Two returned at five months, their babies being in the care of relatives. One returned at six months, but did not continue, as the baby fretted in her absence. Two returned at ten months, giving no reason.

Thirty-six mothers preferred to stay at home. Fifteen said that they found the housework plus caring for the baby as much as they could manage. Three stayed at home because their husbands wished them to do so. Two said they would not trust their babies to anyone else. Two mothers were evacuated because of the air raids. Two did not feel well enough to return to work. Nine mothers said they would return to work if they had somebody to care for the babies, who were all under 1 year and could not, as a rule, be accepted by local day nurseries. Eight women gave no reasons for not returning to work.

In addition to the original 90 cases we have attempted to follow up 40 other mothers who attended our clinic. Through the difficulties previously noted, we were not able to contact more than 22, and only 4 of these had returned to work. One of them lost her baby at two months and then started work; the second started work at six months, the third—a single girl—at four months, and the fourth at nine months. We analysed the reasons why patients did or did not return to work, and the following is a summary of their replies.

Fifteen stated that, with the care of the baby and housework, they had too much to do. Two said their housework and caring for the baby were as onerous as factory work. One mother stated that she found the housework and baby even more tiring than factory work when she was pregnant. Eight mothers visited the clinic only for post-natal examination. Of these six were normal, one had a relaxed outlet, and one fairly severe haemorrhoids.

The medical officers of health of five boroughs in which the patients lived gave the following rules as to the permitted age of entry of babies to their day nurseries:

A. Not under 6 months.
B. From birth to 5 years. Under 3 months only in very special circumstances.
C. One year and over.
D. No minimum age limit, but very young babies accepted only under special circumstances.
E. Not under 6 months except in special circumstances—i.e., unmarried mother, etc.

There appears to be no uniformity locally, and we infer that this may be general throughout the country, although the Ministry of Health issues general recommendations.

The Position in the United States

In a personal communication to one of us (L. B. B.) Dr. Barbara Hewell, Acting Director, Division of Research in Child Development, U.S. Department of Labor, made some interesting observations on the situation in America which are worth recording. Her Department has suggested that women be granted at least two months' leave ordinarily, and longer if parturition or a post-partum period has been in any way complicated (*Standards for Maternity Care and Employment of Mothers in Industry*, U.S. Department of Labor, July, 1942). As most American employers have little or no experience of female labour there is considerable variation in or complete absence of policies in different industries on the subject of maternity leave. There has been no development, on anything like the national scale we have in Great Britain, of nurseries to care for children under 2 years of age of mothers working in war industries. However, centres have been set up for the group care of children from 2 to 5 years of age and also of school age. Federal funds have been made available to communities up to approximately 60% of the cost. There has been some supervision of these by State, Health, Welfare, and Education Departments in the different States.

"The policy of the Children's Bureau is strongly against the development of group care for children under 2 years of age. They feel that the young infant needs the continuous affection and consistent care of his own mother for his best emotional, physical, and mental development. There is no adequate substitute for a mother's care or for the care of some one person who holds this relationship to the child. Regardless of how good a group centre may be as to plant, hygienic conditions, number and training of staff, there remain the danger of communicable diseases when young babies are in groups, and the strong probability that the care cannot be as individual in type, and may not meet the emotional and developmental needs of the young infant.

The man-power situation in this country has not been so urgent that mothers of young children under 2 are essential in industry. It is realized, of course, that some mothers of young babies must work. When substitute care is necessary, the Children's Bureau advises foster-home care for children under 2, as more likely to meet the needs of the individual child. This type of care—both full-time for dependent or neglected children and day-time for children of working mothers—has been considerably developed in this country. This programme is under the supervision of child-welfare agencies whose trained workers approve the homes and the qualifications of foster-parents to care for children, and who give continuing supervision of the child in the foster home, working with both the employed mother and foster-home mother for the best interests of the child. The foster home should be near the child's home, caring for only a few children, and should duplicate home life as much as possible. The working mother pays the foster mother for this care.

There are scattered day nurseries in local communities where young infants receive care under private agency auspices, but this is not an extensive development. Many mothers, of course, make their own arrangements as to care of the children."

The following quotation from an interesting paper by Dr. Charlotte Silverman (U.S. Department of Labor) gives an account of her investigation of the problem:

"*Post-natal Leave of Absence.*—Most of the establishments that did not actually discharge employees on account of pregnancy stipulated that those who were required to take leave of absence

remain away from employment for a specified period. Most of the plants set 6 weeks or 2 months as the required post-natal leave; one set it at 4 weeks, one at 4 months, and one at 6 months. Eleven required the amount of post-natal leave to be decided by a physician (the plant physician or the woman's own physician).

Extent of Return to Work After Delivery.—It was very difficult to find out how many women returned to work after childbirth. Most firms did not keep records of this type. Companies that had been employing women for many years, although they did not keep records of the number of returns, frequently were able to offer estimates. The textile mills had a very high percentage of returns. Some electrical plants also had a high percentage.

Reinstatement and Seniority.—Among the establishments that had high percentages of returns to work the question of reinstatement and seniority was probably a factor in motivating an early return. In several of these plants reinstatement and seniority privileges were effective for only 2 to 3 months after childbirth. If the period in which these privileges were effective were lengthened, women might be inclined to take longer post-natal leave."

Some British Statistics

An investigation on employment of women in industry before and after childbirth in this country carried out during 1940–2 by the Industrial Welfare Society gives the following general information. Twenty-six firms were approached; they all permit a return to work, but the period after pregnancy varies as follows:

At a minimum of 4 weeks	2 firms
" " 5 "	3 "
" " 6 "	6 "
" " 8 "	7 "
" " 12 "	4 "
On application at any time	1 firm
At any time a vacancy occurs	1 "
When fit to return	1 "
Left to opinion of welfare officer	1 "

The statistics of 29 firms who keep records of their pregnant workers gave the following figures:

Firm	Pregnancies	Returned to Work	Firm	Pregnancies	Returned to Work
A	12	1	P	6	4
B	20	2	Q	122	8
C	37	1	R	13	3
D	11	2	S	25	4
E	50	1	T	57	2
F	13	10	U	17	3
G	21	2	V	17	3
H	21	6	W	57	7
I	24	1	X	17	3
J	9	1	Y	24	3
K	3	1	Z	1	1
L	48	3	AA	1	1
M	12	3	BA	4	1
N	11	2	CA	9	2
O	4	4		666	85

One firm commented: "The great difficulty of mothers returning to work is the lack of day nurseries. The unmarried mothers, unless they have sympathetic parents, are forced to have their babies adopted, often against their will. Many married women would like to return to work if there were facilities for these very young babies." Another stated: "Two girls returned to work after one month—both through financial difficulties." None of the firms quoted had an antenatal clinic of their own.

Summary of Conclusions

Surprisingly fe mothers return to work after confinement. In our own series only 18 out of 83 had returned to any work, excluding housewife duties, up to 17 months after confinement.

Death of the baby or financial matters were the main reasons given for the return to paid employment.

From our experience of the normal working mother we conclude that six months is a reasonable time after pregnancy for return to work to be considered.

We are grateful to Mr. R. R. Hyde of the Industrial Welfare Society, Dr. Katherine Bain, and Dr. Barbara Ann Hewell of the Children's Bureau, U.S. Department of Labor, for their co-operation, and to Sister Harwood of our own works antenatal clinic.

S. Solomon, M. Kaslik, and N. Kiven (*Ann. intern. Med.*, 1944, **21**, 639) record three cases of periarteritis nodosa in which the condition was diagnosed during life and confirmed at necropsy. The diagnosis should be considered in patients with prolonged fever of unknown origin who have irregular or baffling symptoms referable to many parts of the body. A biopsy will usually reveal characteristic changes in the smaller arteries. The disease is probably an allergic reaction to many different antigens. There is no specific treatment.

Medical Memoranda

A Diagnostic Problem: An Unusual Case of Hepatitis

The following case is interesting in view of the prevalence of hepatitis. A girl aged 13 months was admitted to the hospital on Sept. 6 as a case of notified cerebrospinal fever (post-basic). Except for occasional "snuffles" the history disclosed nothing abnormal until two weeks before admission. She was then said to have had an attack of bronchopneumonia, treated for four days with 8 g. of sulphathiazole. Subsequently the child had been fretful, and for two days before admission there had been neck rigidity, head retraction, and persistent vomiting.

Clinical History

On examination the child's condition seemed satisfactory—T. 97°, P. 120, R. 26—but she was irritable and had a stiff neck with head retraction; Kernig's sign and Brudzinski's reflexes were negative. The gums were inflamed owing to teething, and the liver was palpable two fingerbreadths below the right costal margin, the upper limit of superficial dullness being percussed at the fifth interspace. Lumbar puncture was performed. The fluid was clear and under normal pressure, and contained "2 leucocytes per c.mm., protein 10 mg., globulin 0, chlorides 770 mg., sugar rather in excess. W.R. negative."

During the next three days the (presumable) meningism disappeared and vomiting ceased. The stools remained normal throughout the illness, while the urine contained a trace of albumin. On Sept. 10 a swelling appeared in the right renal angle. It was hard, deep-seated, immobile, but not attached to adjacent bony structures, and was associated with slight oedema of the overlying skin. On Sept. 11 the lump was larger and softer, but its nature remained obscure. At 4.30 p.m. precisely that afternoon the child screamed violently, became cyanosed, and appeared to be in pain. On examination her colour was ghastly, her extremities cold, pulse impalpable, temperature subnormal, and respirations about 80 per minute. She was gravely ill, and the dramatic suddenness of the change suggested a catastrophe such as an internal haemorrhage or spontaneous pneumothorax. No thoracic signs were elicited, but the liver was over five fingerbreadths below the right costal margin, while the upper limit of superficial dullness was level with the sixth rib on percussion.

Surgical advice was sought, and Mr. Kennedy of Plymouth kindly saw the child. Nevertheless, no diagnosis was made, and the only course available was treatment for shock on the usual lines. By 8.30 p.m. her condition had improved slightly—T. 98.4°, P. ?160, R. 88—and the liver was only three fingerbreadths below the costal margin, but at 10.35 p.m. she collapsed and died, her malady undiagnosed.

Post-mortem Examination

The necropsy was performed by Dr. M. R. Thomas, with the kind permission of Dr. Wordley. Externally there were no distinctive marks and the lumbar swelling noted during life had disappeared. About half a pint of haemorrhagic fluid was found in the right pleural cavity. Otherwise, apart from petechial haemorrhages on the serous surfaces and a small pericardial effusion, the heart and lungs seemed normal. In the abdomen half a pint of bile-stained ascites was found. The liver was tremendously enlarged and engorged, and the cut surface was yellow. The hepatic artery and biliary system appeared normal, as also the duodenum and other viscera, though the right kidney was displaced backward into the loin by the enlarged liver, thus accounting for the mysterious lumbar swelling.

Histologically, the liver showed generalized parenchymatous necrosis, particularly marked in the portal zones. There was neither hyperplasia of liver cells nor bile-duct proliferation. The organ was stained and examined for spirochaetes, but none was seen, nor was evidence of syphilis found. Other organs showed no special changes except scattered petechial haemorrhages.

Discussion

It is unfortunate that investigations, including blood count and urine analysis, were not done, but precise indications were wanting until too late. First, the cause of the meningism remains obscure. It might have been due to the hepatic lesion or even to "teething." It should be remembered that occasionally meningism is a marked feature of intolerance to sulphonamide therapy, particularly in cerebrospinal fever—a highly improbable cause in this instance, however, eight days later. Alternatively Weil's disease with a meningeal onset merits consideration, but it is unlikely that such a case would have been apyrexial throughout, nor were any spirochaetes demonstrated.

The puzzling lumbar swelling received satisfactory explanation at necropsy. More difficult of explanation was the sudden and catastrophic deterioration in the child's condition, with apparent hepatic displacement and enlargement. The rapid accumulation of a haemorrhagic pleural effusion—singular indeed in respect of the complete absence of physical signs in the chest—was probably largely responsible. Sudden cardiac

failure may also have aggravated the general condition and increased the size of the liver from acute passive congestion. No doubt the various effusions and petechial haemorrhages were direct consequences of hepatic failure.

In view of the extensive necrosis it is perhaps surprising that jaundice was completely absent. Either the liver destruction was too rapid or this was really an example of extreme fatty degeneration of the organ following an acute infection —bronchopneumonia in this instance, as was stated in the history. The latter explanation, however, was not supported by the histological findings, but certainly the possibility of a fulminating virus hepatitis cannot be completely excluded.

Lastly, of drugs sulphathiazole alone was given, to a total of 8 g. two weeks before death. Fatal cases of hepatitis are known to have followed sulphonamide therapy, and symptoms have not always declared themselves until after the final withdrawal of the drug. Of all possible causes, this does seem the most feasible; but, unfortunately, the available evidence is inconclusive.

I am indebted to Dr. T. Peirson, medical officer of health for Plymouth, for permission to publish this case; to Dr. D. F. Johnstone, medical superintendent of this hospital, for his interest in the preparation of the paper; and to Dr. M. R. Thomas for the post-mortem examination and preparation of histological material.

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Splenomegaly in Bacillary Dysentery

As we have not found a reference to splenomegaly in dysentery in the limited amount of medical literature which we have been able to search we think the following account of a series of cases may be of interest.

A SERIES OF CASES IN THE MIDDLE EAST

Enlargement of the spleen was found in 50 (5.77%) out of a total of 866 cases of bacillary dysentery admitted to a general hospital in the Middle East between Aug., 1943, and Jan., 1944. The cases had occurred regularly throughout this period. There was no evidence of the presence of any other disease which might have caused splenic enlargement. In none of the cases was there any lymphadenopathy or clinical evidence of anaemia. At least one blood slide was examined in each case, but no malaria parasites were discovered. Only four cases gave a history of previous single attacks of malaria—10/12, 2, 3, and 3 years previously. Three cases were not included in the series, as it was considered malaria might be the cause of the splenomegaly, two of the patients being Cingalese and the other a British "other rank" who gave a history of three attacks of malaria two years previously. Three other cases were excluded, in two of which the splenomegaly persisted for 21 and 28 days respectively, and in the third there was a history of two attacks of short-term fever in the previous two months. It seems unlikely that enteric fever could produce this almost constant picture of sudden onset of diarrhoea, associated with blood and mucus in the stools, fever for 2 to 3 days, absence of rose spots, and fitness for duty in 10 to 12 days.

Twenty of the patients had been in the Middle East for less than four months, and of these eight had been abroad for only four weeks or less. The cases were not confined to one particular camp, but were admitted from various surrounding sites over a wide area.

CLINICAL DETAILS

Except for the splenomegaly all the patients showed the usual clinical features of bacillary dysentery. They were of the mild or moderately severe type. The average duration of diarrhoea was 2.88 days (maximum 10 days; minimum 1 day—7 cases). The temperature on admission ranged from 99° to 102° in 38 cases, but in 12 there was no fever. Two cases were febrile for 3 and 5 days respectively, but the remainder had a normal temperature after 48 hours.

In 46 cases blood and mucus appeared in the stools; 23 cases on microscopy showed bacillary exudate and 27 cases indefinite exudate; 4 cases had liquid stools with mucus and showed indefinite exudate. Of 31 cases in which a culture was performed 13 showed the Flexner bacillus (Flexner I, 3 cases; Flexner II, 6 cases; undetermined, 4 cases) and 18 showed no pathogens.

In 49 cases the spleen was palpable on the day of admission and in one on the day after admission (3rd day of disease). In 37 cases the spleen on inspiration reached a point 1 fingerbreadth below the costal margin, in 10 cases 2 fingerbreadths, and in 3 cases 3 fingerbreadths. In 43 cases the spleen remained palpable for 2 to 6 days only, but in 7 cases the edge could just be felt on discharge from hospital on the 15th to 18th day of disease. In one of these cases, which it was possible to review, the spleen was no longer palpable 3 months later. Total and differential white blood cell counts were carried out in 22 cases. No constant abnormality was present. The average total was 6,959 (maximum 15,300, minimum 3,200). The average proportion of polymorphonuclear leucocytes was 62%.

DISCUSSION

The cause of the splenic enlargement in these cases is not understood. As already stated, malaria, enteric group fevers, and other obvious causes of the splenomegaly were excluded. It is suggested that it is a non-specific phenomenon, and this is borne out by the fact that similar splenic enlargement was found to occur equally commonly in certain other infectious diseases in the Middle East (Illingworth, 1944, personal communication). Illingworth reported that splenic enlargement occurred in 6.3% of 221 cases of diphtheria seen by him, 5% of 81 cases of tonsillitis, 7.8% of 42 cases of scarlet fever, and 5.3% of 38 cases of measles. In only 4 of these cases was there a previous history of malaria and in no case was there any other discoverable cause for the splenomegaly. In all except one case the splenic enlargement had subsided within a fortnight of the onset of the infection. It is interesting that the frequency of splenomegaly in these infectious diseases was approximately the same as that of the cases of bacillary dysentery reported above.

We are indebted to Major R. S. Illingworth for his invaluable help and also to Lieut.-Col. Bodley Scott for his criticism and advice. We should also like to thank Col. W. B. Stevenson, officer commanding a Middle East general hospital and Brig. W. K. Morrison, officiating D.M.S., M.E.F., for permission to publish this article.

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Jaundice during Arsenotherapy

In view of the general interest taken in the causation of jaundice during arsenotherapy, it may be of value to record some observations made at the neurological clinic, Metropolitan Hospital, on a consecutive unselected series of 12 cases. These patients were all suffering from neurosyphilis; their ages ranged from 13 to 64 years. Treatment has consisted of intramuscular or subcutaneous injections of 3 c.cm. of acetylarsan (May and Baker), together with 0.5 c.cm. of intramuscular bismostab in courses of 10 to 12 injections, with intervals of one month. Potassium iodide orally was also given. By the use of this preparation of arsenic given by these routes over a period of 2 to 4 years, possible transference of minute quantities of serum from patient to patient, as suggested by Major Salaman (1944) to be a potential cause of jaundice, is avoided.

These patients were carefully observed while undergoing treatment, and it is significant that not a single case of jaundice occurred. This suggests that where the intramuscular or subcutaneous rather than the intravenous route is used there is little likelihood of jaundice occurring. This seems to be supporting evidence for the belief that the hepatitis which is sometimes produced during arsenotherapy is not a direct toxic effect due to the arsenic but is rather of an infective origin, as is now thought to be the case in homologous serum jaundice or in the jaundice occurring after yellow-fever vaccination. Particulars of the cases are as follows:

Case	Sex and Age	Disease	W.R.	Commencement of Arsenotherapy	No. of Courses	No. of Inj.
1	M 55	Meningo-vasc. syph.	+	Mar., 1941	4	10
2	M 13	Cong. G.P.I.	+	" "	5	12
3	F 49	A.R. pupils ? Syph. died out	−	" "	2	12
4	F 36	Meningo-vasc. syph.	+	Nov., 1941	5	12
5	F 36	Cong. tabes dorsalis	+	Nov., 1942	5	12
6	M 57	Meningo-vasc. syph.	+	Feb., 1942	5	12
7	F 33	G.P.I.	+	Apr., 1942	4	12
8	F 49	Tabes dorsalis	+	June, 1942	4	12
9	M 56	Meningo-vasc. syph.	+	Aug., 1942	4	12
10	F 36	Cong. tabes dorsalis	+	Nov., 1942	3	12
11	M 55	Taboparesis	+	June, 1943	3	12
12	M 41	"	+	Aug., 1943	3	10

Cases 2 and 7 received malaria therapy previously. All the above cases now have a negative Wassermann reaction.

I wish to thank Dr. Worster Drought and Dr. N. G. Hulbert for access to the case records, and the latter also for his kind help and advice.

Metropolitan Hospital, E.8. B. GREEN, M.R.C.S., L.R.C.P.

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Reviews

PARASITIC PROTOZOA OF MAN

Manual of Human Protozoa: With Special Reference to their Detection and Identification. By Richard R. Kudo, D.Sc. (Pp. 125; illustrated. $2.00 post paid or 11s.) Springfield and Baltimore: Charles C. Thomas; London: Baillière, Tindall and Cox. 1944.

This little book is likely to be of considerable value to those who are taking up for the first time the study of the parasitic protozoa of man. It gives clear and concise descriptions of the various protozoa, outlines of their life-histories, and the methods of their transmission, whether contaminative or inoculative. The illustrations, usually original, are for the most part excellent. That of *Trypanosoma gambiense* could be improved, for it does not depict the three forms which are characteristic of the group of polymorphic trypanosomes to which this type belongs. The same remark applies to the illustration of *T. rhodesiense*, though here the posterior nuclear forms are shown. On the subject of transmission of oriental sore the sandfly is rightly blamed, but the author appears not to be aware that there is equally strong evidence of the sandfly as a vector of kala-azar. In addition to the description noted above, chapters are devoted to the technique employed for detecting the protozoa of the digestive tract and those of the circulatory system. As culture methods are advocated for leishmania and trypanosomes, it would not have been out of place to refer to cultivation of the intestinal protozoa. There is a chapter on the coprozoic protozoa, which, developing in stale faeces, must not be confused with the forms parasitic in the intestine, while various extraneous objects which may occur in faeces and can lead to errors in diagnosis are noted. Similarly reference is made to objects which may contaminate blood films and be mistaken for malarial parasites or other organisms.

The book, which is beautifully got up, contains in a small space a great deal of useful information. Undoubtedly it will fulfil the author's hope that it will serve as a practical guide to those who contemplate the detection and identification of the human protozoa.

THE LIVING CELL

What is Life? The Physical Aspect of the Living Cell. By Erwin Schrödinger, Senior Professor at the Dublin Institute for Advanced Studies. (Pp. 91. 6s.) Cambridge: The University Press. 1944.

It is not long ago since the gulf between the living and the non-living was regarded as impassable, but now the increase of knowledge in the sciences of microbiology, chemistry, and physics makes it seem that the solution of the problem of making life in the laboratory only just eludes us. In these lectures, now presented in book form, a very distinguished physicist makes his contribution to that solution. First he points out that modern physics is largely statistical—that is, it deals with tendencies in very large numbers, though it is well known that individual units in these large groups behave very differently from the group as a whole. This may be illustrated by the random heat movements of units contrasted with the orderly movement of magnetism or the Brownian movements of an individual droplet in a uniformly sinking fog.

So far physical laws have applied to a periodic crystal, whereas the chromosome fibre, the most essential structure in a cell, may be of the nature of an aperiodic crystal, for which different laws must be invoked to explain its properties. The division of the chromosomes and the mutations on which heredity and evolution depend are next considered. The gene unit is probably a molecule—i.e., a relatively stable collection of a comparatively small number of atoms which only occasionally change their relationships (mutation). These changes may be compared to the quantum jump familiar in ordinary physics. Delbrech's model is discussed in relation to mutations, and it is suggested that the difference between living and non-living substances is that between negative and positive entropy, the living material absorbing orderliness (negative entropy) from the environment, thus delaying its decay with thermodynamical equilibrium (death). The power of absorbing orderliness seems to Dr. Schrödinger to depend on the presence of aperiodic solids, the chromosome molecules in living matter. If this can be accepted it removes the pessimistic view of the physicist that the ultimate fate of the universe is to "run down" into universal death.

To all who are philosophically inclined this little book will prove fascinating, but the hard-boiled materialist will probably be well advised to pass it by.

A RED INDIAN TRIBE

The Navaho Door. An Introduction to Navaho Life. By Alexander H. Leighton and Dorothea C. Leighton. Foreword by John Collier, Commissioner of Indian Affairs. (Pp. 149; illustrated. $4.00 or 22s. 6d.) Massachusetts: Harvard University Press; London: Oxford University Press. 1944.

There are some 370,000 Red Indians in the U.S.A., one half full-blood and the other half mixed—chiefly with whites, some being negroid. There are 200 tribes speaking as many languages; but about 56,000 Indians know only their own tongue. *The Navaho Door* deals with the tribe that occupies the Navaho Reservation—by far the largest of these settlements; it is in the south-west of the United States.

The authors of this book, Drs. A. and D. Leighton, under the aegis of the U.S. Indian Service, have studied this tribe from social, cultural, medical, and psychiatric points of view. Americans have made a world-wide specialty of cultural relationships, entailing much labour of concentrated thought concerning the minds and bodies of the people they are observing. They thereby gain experience in race tolerance and the source of future international peace. But with the purpose of bettering the faulty social characteristics of the Red Indians these people have been despoiled of all they had to offer—cheap labour and land.

The authors supply general information about the Navahos, and, because they are both physicians, they devote a good deal of space to health problems, improvement of the ways the sick are handled in their homes, and the methods adopted to teach the benefits of early admission to hospital. Life-histories are given in detail in order to gain personal knowledge of how the Navahos view their lives in health and disease. Though the science of anthropology is dealt with in a rather cursory manner, the book is a close and interesting study of a native race living in an outpost of civilization. There are thirty-four striking photographs to illustrate the text. The price may, however, lessen the wider circulation that this volume deserves.

Notes on Books

One of the undertakings of the Charity Organization Society is the compilation of an *Annual Charities Register and Digest*, of which the 52nd edition, for 1945, has now been published by Longmans, Green and Co. As in former years, this gives information about the societies, associations, and other bodies that provide relief in affliction and distress of all kinds; it is in fact a classified register of charities in or available for the Metropolis. There are 43 sections, the last three dealing with special war organizations, hostels for H.M. Forces, and refugees; there is also a full index. Copies (price 10s. 6d.) may be had from the C.O.S., Denison House, Vauxhall Bridge Road, S.W.1, or from the publishers.

For Childless Wives, by a doctor, is a simply and clearly written pamphlet of 16 pages published for the Family Planning Association by H. K. Lewis and Co. Ltd. It is written for the benefit of sterile couples so that they may know what the problem is and how it can be tackled. Any practitioner who wants to give such information to his sterile patients will find this pamphlet the easiest way of doing it. As Lord Horder observes in a foreword, "There is a special and a growing need to instruct husbands and wives as to the steps they should take in respect of the wanted child which fails to arrive." An edition of this pamphlet for clinics and hospitals is to be sold at 6d.; the edition for the public is to be sold at 2s. The work of the Family Planning Association depends on voluntary subscriptions, and presumably it is hoped that the sale of the pamphlet at the latter price will bring in money for the development of clinics.

R. F. Watson, S. Rothbard, and H. F. Swift (*J. Amer. med. Ass.*, 1944, **126**, 274) state that penicillin in doses ranging from 1,975,000 to 3,470,000 Oxford units, given over a two-week period to eight young adults with acute rheumatic fever, apparently failed to alter the course of the disease.

BRITISH MEDICAL JOURNAL

LONDON

SATURDAY FEBRUARY 10 1945

WAR SURGERY IN THE U.S.S.R.

"The Russian soldier is safe in the hands of the Russian surgeon": with these words Sir Ernest Rock Carling summarized the impression formed by British surgeons after their visit to the Soviet Union eighteen months ago. One of the features which most impressed the visitors from this country was the organization of military surgical services in the Red Army. In forward areas, up to a depth of 50 to 100 miles, treatment of the wounded is the responsibility of the chief surgeon of the Red Army Medical Corps, Colonel-General Smirnov—an alert, forceful, and vigorous young man whose contribution in this week's *Journal* emphasizes the reality with which his task has been faced and the success with which it has been accomplished. The Red Army surgeon is a soldier as well as a doctor; he recognizes that organization is "determined more by the military situation than by purely medical consideration"; he knows that his first task is "to return the maximum number of wounded to the ranks"; and he directs lightly wounded not to the usual lines of evacuation but to a special local hospital so that rapid return to the front line is assured. For the more seriously wounded, specialist treatment is provided not only in base hospitals but in forward zones. Within a few miles of the front line there is segregation of cerebral, facio-maxillary, thoracic, and orthopaedic cases. Such a plan is ideal. But the difficulty is at once apparent. How is it possible to provide the necessary number of specialist surgeons? General Smirnov gives two answers to this question. The first may be unavoidable, but it nevertheless has drawbacks: "Success in this respect has only been possible in accordance with a simple doctrine based on the following principle . . . a single school of thought with uniformity in methods of prophylaxis and treatment." Such uniformity is characteristic of Soviet Medicine. On reflection it is difficult to conceive how it could have been otherwise. Thirty years ago there were thirteen medical faculties for the whole of the vast continent of Russia; to-day no fewer than 25,000 doctors qualify every year. Is it possible that so vast a problem could have been solved in so short a time without standardization and uniformity? Is it possible that a similar demand, created by the exigencies of war, could have been met without "a single school of thought"? It is noteworthy that this solution has also been adopted by the medical services of the United States Army, so that, for example, every fracture of the shaft of the humerus sustained by an American soldier in Europe is treated, in accordance with directions from Washington, by skeletal traction from the olecranon. But let it be remembered that surgical standardization is a special solution of a special problem. As Watson-Jones recently maintained in discussing the orthopaedic service of the Royal Air Force: "Central dictation of technique is the easy method of assuring a uniformly high standard, but from the point of view of surgical progress it is the pernicious method." The second answer given by General Smirnov to the problem of rapid development of specialist services is one that might be expected from a young and virile organization which can appoint as its chief surgeon a man who has not yet reached the age of 40: "The whole Red Army Medical Corps, from general to private, is being systematically trained. It is studying the new experiences which have been gained. . . . The Red Army medical service does not stand still." This is the triumph of youth—a triumph which is engaged not so much in recording the successes of the past as in facing the problems of the present and the future.

After treatment in forward areas the wounded of the Red Army are evacuated to civilian hospitals in the rear under the direction of the Commissar of Health, assisted among others by Prof. Priorov, chief surgeon of the R.S.F.S.R. and director of the Moscow Institute of Traumatology and Orthopaedics, and Dr. Kotov, director of the Ukrainian Institute of Orthopaedics and Traumatology in Kharkov, both of whom contribute articles to this week's *Journal*. These two surgeons have honoured us by their visit to this country, and have commanded the respect and esteem of every British surgeon with whom they have come into contact. Our sympathy goes out to Prof. Priorov, whose knowledge of Britain has been amplified by long residence in a nursing home, recovering from a serious operation. We can wish no more for him than he claims for the victims of amputation: "Only work can complete their rehabilitation; only work can heal their severe psychic wounds and restore their shaken nerves." These are the ideals we also have set ourselves. Rehabilitation through work is the purpose of our Disabled Persons (Employment) Bill. The problems of treatment of the war disabled in the Soviet Union and in Britain are the same; we are dealing with them in the same way. We can learn from each other.

At this moment we may look with admiration at the way the medical organization of the Red Army is standing up to the immense strain imposed on it by the tremendous onslaught of the Russian Marshals on the Eastern Front. At such a time it is a privilege to be able to publish in these columns articles by Russian surgeons which afford the British reader a glimpse at their problems and at the way they set about solving them.

THE POWER OF THE PURSE

Medical men and women will read with interest a reply given by Mr. Willink in the House of Commons on Jan. 18 to a question on the Goodenough Report on Medical Education.[1] He said that the Government, recognizing the importance of medical education and research, had accepted the principle of increased grants for these

[1] *British Medical Journal*, Jan. 27, 1945, p. 136.

purposes to be distributed by the University Grants Committee, through universities to medical schools, post-graduate schools, and institutions and hospitals used for teaching and research. The Government shared the views of the report "on the importance of affording to women equal opportunities to those enjoyed by men for medical training and for obtaining postgraduate experience." It has therefore decided that the payment of grants to medical schools will depend upon whether or not they adopt the principle of admitting a "reasonable proportion" of students of both sexes. There is logic in this situation which even the most hardened antifeminist must accept. If the country needs doctors, as it does, and needs women doctors also, as it does, then the Government can hardly be expected to make an exclusive subsidy for male students. All the same, educationists, looking at education from the wider standpoint, may wonder whether it is wise generally to enforce co-education by the threat of the purse.

But when we read in the same reply that the Minister is using the same threat in what seems to be an attempt to arrogate to himself powers belonging constitutionally to another body we may well feel alarmed. "The Government," it is stated, "attach equal importance to the revision of the medical curriculum, and acceptance of the principle of increased grants for medical education and research is dependent on the early completion of this process." Having delivered this edict, Mr. Willink adds that the Government is "glad to learn that, as recommended by the [Goodenough] Committee, the G.M.C. has already taken the initiative in the matter." Unless we have misread this statement of Government policy it appears that, through its Ministry of Health, the Government is doing two things. It is first of all threatening to withhold money from medical schools, who are not responsible for revising the medical curriculum, unless the curriculum is revised by licensing bodies, who are responsible for any such revision (it insists on "early completion"). The Government is, in fact, using the power of the purse to coerce those responsible for teaching medical students. Secondly, it is abrogating the functions of the G.M.C. and, by implication, is questioning its efficiency in maintaining standards of medical education.

The Goodenough report is a significant, if rather verbose, contribution to the subject of medical education. The Royal College of Physicians recently published an equally authoritative and more succinct report on the same subject. The B.M.A., too, was early in the field, with a sane pronouncement on the eternal theme of medical education. From these and other sources those responsible for medical education will seek inspiration and will weigh in the balance the findings and recommendations of the Goodenough as of other committees. But is it the intention of the Ministry of Health to try to enforce revision of the curriculum on the strength of the conclusions reached by a committee of its own choosing? And is it to do this by the rather vulgar trick of withholding money meant for education and research? Has the Minister of Health forgotten that the responsibility for maintaining standards of medical education lies with the General Council of Medical Education and Registration, to give the G.M.C. its full title? The G.M.C. is a statutory body set up by the Medical Act of 1858. It maintains standards of medical education by indicating to licensing bodies in the form of recommendations what it will regard as an adequate minimum curriculum, and by satisfying itself, through inquiry, visitation, and inspection, that no particular curriculum is in this sense inadequate. If it is not so satisfied it may make representations to the Privy Council, which, on review of all the evidence, may suspend the right of a licensing body to qualify men to practise. This provides a check to hasty and ill-considered action. If the G.M.C. defaults in its duties the Privy Council may require it to mend its ways, and indeed may exercise the powers of the G.M.C. if it does not do so. There seems to be no call for this latest intervention of the Ministry of Health in a matter in which the constitutional responsibility of "the Government" has rested primarily, ever since a *Medical Register* was first compiled, with the Lord President of the Council as the Ministerial head of the Privy Council Office.

BAROTRAUMA

Experimental observations by Armstrong and Heim[1] on five healthy men are the foundation of accurate knowledge of the physiology of the Eustachian tube in aviation, though the work was published only seven years ago. These men were subjected to changing rates of pressure varying from 5.4 mm. to 27 mm. of mercury per minute, corresponding to 200 ft. to 1,000 ft. of altitude per minute, through ranges of pressure from 141 mm. to 760 mm. of mercury, corresponding to 0 ft. to 40,000 ft. in altitude. By decreasing the pressure from sea level (760 mm.) at a constant rate it was found that a change of 3 to 5 mm. of mercury, corresponding to 110 to 180 ft. in altitude, was required to produce any effect. The discomfort increased until at 15 mm. of mercury, or 500 ft. in altitude, an involuntary click was felt in the ears and the sensation of fullness was relieved. Succeeding clicks occurred at intervals of 11.45 mm. of mercury, or 435 ft. of altitude, the succeeding clicks during ascent corresponding rather to change in altitude than to identical differences in rarefaction: that is to say, that during ascent the Eustachian tubes open involuntarily and equalize the pressure in the tympanum with that in the atmosphere outside. In descent, however, the effect of changing pressure is different. The Eustachian tubes remained closed under all degrees of pressure, and finally the tympanic membrane ruptured unless the tubes were opened by the act of swallowing, which becomes impossible when a negative pressure of 80 to 90 mm. of mercury is produced in the middle ear. Frequent voluntary acts of swallowing are necessary, therefore, to maintain pressure equilibrium. The effect on the middle ear was called acute aero-otitis media, and the discomfort and deafness from the retraction and stretching of the tympanic membrane caused by repeated exposure to this form of injury were symptoms of a chronic form. There is, however, no inflammatory change, unless it be a secondary effect of the injury, and therefore in the interests alike of accuracy and euphony the term otitic barotrauma has now taken its place and has been adopted by the R.A.F.

Since then barotrauma has played an important part in the problem of maintaining the fitness and efficiency of air crews, and the effects have been studied both clinically and in a decompression chamber designed for the purpose. Pain, deafness, tinnitus, and occasionally verti-

[1] *J. Amer. med. Ass.*, 1937, **109**, 419.

are the symptoms, naturally of varying degree, and are relieved as soon as the pressure equilibrium is restored by swallowing, by Valsalva's experiment, politzerization or even Eustachian catheterization, or by re-ascent. Objective physical signs may be scarcely seen, but varying degrees of congestion of the tympanic membrane and middle ear may be observed, as shown in some beautiful coloured plates from drawings by McGibbon.[2] Haemorrhages, effusion into the middle ear, and even rupture of the membrane may occur. Although the prognosis is good the condition is common and temporarily disabling, not only to the individual but, as R. M. S. Matthews[3] has emphasized in this *Journal*, also to the crew of which he is a member if he should be rendered unable to go into action even for one day. The cardinal factor in the production of barotrauma is obviously Eustachian obstruction, which may be of a degree sufficient to cause only trivial or negligible symptoms at ground level, but enough to prevent free ventilation at changing altitudes, especially rapid descent, and so cause barotrauma. Ordinary clinical examination and testing in the decompression chamber will suffice to eliminate a number of those particularly liable to develop acute barotrauma, estimated by Dickson[4] at 8.9%. Any measures which will lower the incidence of infectious coryza are important in eliminating acute Eustachian catarrh, and some responsibility must rest on the medical officer in making the decision whether a member of an air crew may or may not fly if he has a cold in the head. It may be added that similar considerations apply to the accessory sinuses of the nose, for, although they possess no such active mechanism as does the Eustachian tube, changes of pressure may cause acute and disabling pain if the ostium, particularly of the frontal sinus, becomes obstructed.

THE B VITAMINS AND HARD WORK

It has often been stated that diets very deficient in vitamin B will cause serious physical and psychological deterioration after a few days' hard work. In their studies on induced vitamin B_1 deficiency in human volunteers R. D. Williams and his collaborators[5] reported a syndrome closely resembling that of neurasthenia: muscular atony and tenderness, nausea, vomiting, faint heart sounds, changes in the electrocardiogram, tachycardia, lowered blood pressure, apathy, photophobia, anorexia, abdominal distension, paraesthesiae, and fatigue. Psychological disturbances included depression, fear, irritability, inattention to details, confusion of thought and memory, headache, insomnia, tenseness, intolerance of noise, and increased sensitivity to painful stimuli. These manifestations, however, appeared only after prolonged vitamin B_1 deficiency, and the subjects of the test did not perform heavy work. Similar observations were reported by other workers.[6 7] Jolliffe[6] reported deficiency symptoms—anorexia, dyspnoea on exertion, precordial pain, palpitation, and fatigue—as early as the third day in subjects on a diet poor in vitamin B_1. Johnson and his colleagues[8] subjected ten volunteers to hard physical work on diets deficient in the vitamin B complex and reported fatigue, deterioration in physical fitness, muscle pains, and poor appetite after a few days. Egaña and others[9] made similar observations on men doing manual labour. Barborka, Foltz, and Ivy[10] also noted that diets poor in vitamin B and riboflavin produced symptoms of easy fatigue, irritability, anorexia, and pains in the leg in men doing active physical work. More recently Archdeacon and Murlin[11] observed that muscular endurance is greatly decreased on a diet low in the vitamin B complex and providing only 0.27 mg. of vitamin B_1 daily.

These observations, which have been generally accepted, are now challenged by Keys and his co-workers,[12] who claim that they were not made under sufficiently controlled conditions. They kept eight men doing severe and exhausting physical work for 14 days on a diet providing only 0.16 mg. of vitamin B_1, 0.15 mg. of riboflavin, and 1.8 mg. of nicotinic acid per 1,000 calories daily—less than a third of the computed daily requirements of subjects performing heavy work. Comprehensive clinical examinations, psychological tests, and objective tests covering endurance, anaerobic work, speed, co-ordination, and muscle strength failed to show any significant changes in the subjects on the diet. The men were admittedly rather stiff and sore, but this was attributed to hard work on the treadmill. There were no significant changes in blood lactate and pyruvate, which are said to rise in subjects doing heavy work on diets deficient in vitamin B_1. Keys and his co-workers attribute the subjective symptoms described by Jolliffe, Johnson, and others to suggestion, as they are of the vague type commonly associated with the neurotic patient. They also criticize the conditions of experiment: a group of sedentary laboratory workers, conditioned to expect certain effects, were suddenly put to unaccustomed physical work and given a peculiar and monotonous diet. In other words, certain results were anticipated and obtained. In the test devised by Keys the subjects spent a control period of three weeks performing heavy physical work on a controlled standard diet. Then they were given the deficient diet while performing the same heavy work. Further investigation is plainly needed to reconcile these contradictory observations, particularly in view of the recent statements that biosynthesis of vitamin B_1, riboflavin, and nicotinic acid may occur in the human intestine,[13-15] and so complicate all human experimental work with these vitamins.

SHOCK THERAPY AND CONDITIONED REFLEXES

While the beneficial results of shock therapy in schizophrenia are widely accepted, the way that treatment works has remained a mystery. The hypothesis of von Meduna[16] was that, since epilepsy is rarely observed in patients with psychosis, the subjection of psychotic patients to epileptoid convulsions might improve the psychosis. But what do we know of the effect of convulsions on the nervous system? Some interesting results have lately been obtained by E. Gellhorn.[17] With Darrow[18] he first studied the action of leptazol on the systems of the cat which are innervated by the autonomic. They demonstrated that leptazol not only caused convulsions but had other effects which could be observed when the convulsions were prevented by curare. Thus leptazol caused a fall of blood pressure, a dilatation of the pupil, a contraction of the nictitating membrane, and increased sweating. More important than these immediate effects was that for some hours after convulsions had been induced sympathetic reflexes were

[2] *J. Laryng. Otol.*, 1943, **58**, 474.
[3] *British Med cal Journal*, 1944, **2**, 523.
[4] *J. Laryng. Otol.*, 1943, **58**, 465.
[5] *Proc. Mayo Clin.*, 1939, **14**, 787; *Arch. intern. Med.*, 1940, **66**, 785; 1942, 69. 721; 1943, **71**, 38.
[6] *Amer. J. med. Sci.*, 1939, **198**, 198.
[7] *J. clin. Invest.*, 1930, **19**, 153; *Amer. J. med. Sci.*, 1940, **200**, 757.
[8] *J. Nutrit.*, 1942, **24**, 585.
[9] *Amer. J. Physiol.*, 1942, **137**, 731.
[10] *J. Amer. med. Ass.*, 1943, **122**, 717.
[11] *J. Nutrit.*, 1944, **28**, 241.
[12] Ibid., 1944, **27**, 485.
[13] *J. Amer. med. Ass.*, 1943, **123**, 683.
[14] Ibid., 1944, **126**, 357.
[15] *Nature*, 1944, **154**, 270.
[16] *Z. ges. Neurol. Psychiat.*, 1935, **152**, 235.
[17] *Journal-Lancet*, Minneapolis, 1943, **63**, 307.
[18] *Arch. internat. Pharmacodyn. Thérap.*, 1939, **62**, 114.

elicited more readily than before; thus the dilatation of the pupil on stimulating the brachial plexus was increased. They therefore concluded that one effect of leptazol was to heighten the reflex excitability of sympathetic centres.

More impressive, however, is Gellhorn's[17] recent work on conditioned reflexes. He placed a rat in a cage divided into two parts by a low partition over which it could jump. An electric current was passed through the floor on which the rat stood, so that when it got a shock it jumped to the other side of the cage. The conditioned reflex was developed by ringing a bell for 2 seconds before applying the shock. By repeating the combination of the sound of the bell and the electric shock Gellhorn set up a conditioned reflex, so that the rat would jump from one side of the cage to the other when the bell was rung and no shock was applied. Having developed this conditioned reflex, he reinforced it for two or three days by applying both bell and shock, and then applied the conditioned stimulus alone, 10 times daily. After 4 or 5 days the rat no longer responded to the bell because, due to lack of reinforcement, the reflex faded. If now he subjected the rat to shock "therapy," either by causing convulsions electrically, or by injecting leptazol, or by injecting insulin and producing coma, then when this experience was over, the conditioned reflex was restored to a greater or less extent and for a longer or shorter time. Electrical convulsions were least effective in restoring the conditioned reflex, being inactive in some rats and only temporarily active in others. Leptazol was intermediate in efficiency, while best of all was insulin coma. Two or three periods of insulin coma, at suitable intervals, often fully restored the conditioned reflex, so that the rat responded every time the bell was rung and continued to do so for as long as 11 or 12 weeks. One other observation of importance was made. Some resistant rats in which insulin coma had little and transitory effect, so that the conditioned reflex was not restored, had injections of thyroxine. The conditioned reflex was then restored even by electrical convulsions, though these were quite ineffective before the thyroxine was given. Gellhorn believes that the action of thyroxine was central because the amount used did not potentiate any peripheral sympathetic effects.

The interest of these results for the clinician is obvious enough, for much good social behaviour depends on reflexes which are induced or conditioned. Gellhorn's work seems to be a fairly accurate experimental reproduction of what is probably happening in shock therapy, and throws quite new light upon it.

EPISIOTOMY

Laceration of the perineum is probably the commonest lesion of childbirth. This has been recognized from the earliest days, and Hippocrates advised the use of oil and hot douches to soften the parts and thus prevent rupture of the perineal tissues. The importance of preserving the perineum intact, if possible, is rightly emphasized in the teaching of medical students and pupil midwives. In a recent article in this *Journal*[1] J. D. S. Flew suggests, however, that the attempt to preserve an intact perineum may be made at too great a cost. Not only may the second stage of labour be prolonged, with harm to the mother and child, but overstretching of the vaginal walls and their supports may lead to prolapse, particularly to cystocele. The vaginal walls may also be lacerated, even though the perineum remains intact. Such lacerations may go unrecognized and thus be left unrepaired, with consequent risk of sepsis. Because of these dangers Flew recommends early episiotomy in all cases in which delay in the second stage of labour is caused by the resistance of the perineal tissues.

In spite of the best obstetrical skill, spontaneous laceration of the perineum is inevitable in many cases. The question then arises whether it is better to allow the perineum to tear or to anticipate this by a deliberate incision of the tissues. The difference between a minor laceration and an episiotomy is probably slight. It is rarely easy, however, to judge where a spontaneous laceration will end, and it may extend into the rectum. Such lacerations are often ragged and accompanied by much bruising of the tissues, which makes their repair difficult. Flew therefore advocates early episiotomy, and his view has been supported in a letter to these columns from T. N. A. Jeffcoate,[2] who, while he does not agree that episiotomy will prevent prolapse of the uterus in all cases, believes it to be particularly valuable in the prevention of cystocele. There are many indications for episiotomy. Flew has remarked on its value in cases of foetal distress, as when the head is on the perineum. He also quotes Berlind,[3] who advocated episiotomy in cases of premature delivery in order to prevent cerebral haemorrhage. Forceps cases and breech delivery, especially in primigravidae, are much eased by episiotomy. (Burns and Marshall[4] recommend the injection of 50 c.cm. of 0.5% procaine into the perineum as a preliminary to episiotomy in breech delivery in a primigravida.) Episiotomy is indicated in spontaneous delivery of an occipito-posterior position face to pubes, in face presentation, in cases in which the pubic arch is narrow, and in any patient who has previously had a colpoperineorrhaphy or a severe laceration. Episiotomy may also prove of value when it is desirable to hasten delivery—for example, in cardiac or pulmonary disease which calls for a shortening of the second stage.

When should episiotomy be performed? Flew recommends that it should be done when bulging of the perineum is apparent, and points out that an episiotomy performed too early is preferable to one performed too late. Four possible sites for the incision have been described: lateral, medio-lateral, median, and multiple small incisions around the vaginal orifice. Of these, most obstetricians prefer the medio-lateral, but Flew describes a J-shaped incision, beginning as a median incision and turning to one or other side to avoid the rectum. In any case it should begin at the midline at the fourchette. Bilateral episiotomy is mentioned only to be condemned, since the blood supply to the perineum is cut and sloughing may result. The medio-lateral episiotomy can always be extended to give as much space for delivery as is required. After episiotomy the perineum and vaginal walls should be repaired in layers, and this should be done with care. If the incision is medio-lateral it must be remembered that it has been made obliquely and thus must be repaired obliquely. Local analgesia should be induced except in cases of operative delivery under general anaesthesia. In the latter it is reasonable, provided the patient's general condition is satisfactory, to continue light anaesthesia while the necessary sutures are inserted into the perineum. In the great majority of cases the results of episiotomy are highly satisfactory, and the incision usually heals by the end of a week. The most usual cause of failure of healing is sepsis, and, when the perineal wound breaks down because of this, early secondary repair, as soon as the raw surfaces are clean and granulating, should be performed—a relatively simple procedure that may save the patient months of discomfort and often permanent disability.

[1] *British Medical Journal*, 1944, **2**, 620.

[2] *British Medical Journal*, 1944, **2**, 734.
[3] *Med. J. Rec.*, 1932, **135**, 180.
[4] *British Medical Journal*, 1934, **1**, 820.

PERITENDINITIS, OR FOOT-SLOGGER'S NODULE

BY

H. DAINTREE JOHNSON, F.R.C.S.

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This condition is uncommon in peacetime and, to the best of my knowledge, has not hitherto been described, though it must be familiar to the medical officers of all hard-marching units. I have seen many cases in an airborne division in which the men are trained to march up to 50 miles in 24 hours. The lesion presents as a painful swelling over a tendon, and always corresponds to a point of pressure such as a fold in the leather of a boot. It occurs particularly on the tendo Achillis, the tendon of the tibialis anticus, and the flexor tendon of the hallux. Pain comes on during a march and causes alteration of gait and limping or clawing of the toes in an effort to relieve pressure on the tender area. There is characteristically no pain at rest, and this helps to distinguish the lesion from an infective one.

On examination of a recent case there is found to be some firm localized swelling over and round the tendon. The swelling is tender to firm pressure with the fingers, but not nearly so tender as an infective lesion. However, continued trauma by the hard boot-fold is very painful. If the condition is not treated and the offending boot continues to be worn, a hard thickening forms and there is crepitation on movement. Gradually it becomes a well-circumscribed elevated nodule, or often two nodules with a groove between, each about 3/4 in. wide and 1/4 to 1/2 in. thick. The nodule is closely adherent to the skin, but can be lifted off the tendon, and does not appear to be connected with the tendon sheath, when present. On account of the crepitus the early cases are often sent to the specialist with a diagnosis of "teno-synovitis." It might be noted, therefore, that crepitation is most common in the tendo Achillis variety in which there is no tendon sheath. Tendinitis is also becoming a popular diagnosis of unelucidated pathology, but there is no evidence for it here.

When there is a groove between two nodules it is in the groove that tenderness is most pronounced. The groove corresponds to the causative crease or lace. This I have seen most commonly over the tibialis anticus tendon, where it is produced by that cross-piece of the lace which is most nearly opposite to the ankle-joint and is most likely to cut in on dorsiflexion of the foot.

Aetiology

It is usually found either that the sufferer is a new recruit or that he has a new pair of boots or an old pair in which the stiffness of the leather has suddenly given way, forming a new crease. I have never seen the condition occur with really old well-softened boots. Boots which are too large are as likely to cause the condition as those which are tight. In fact, the hallux type occurs typically with boots that are too long and which form a deep crease just behind the toe-cap.

The commonest site for peritendinitis is over the Achilles tendon, as it is here that a fold always forms if the boots are laced to the leg above the ankle-joint. The crease projects forwards as shown in Fig. 1. Tightly strapped gaiters are an

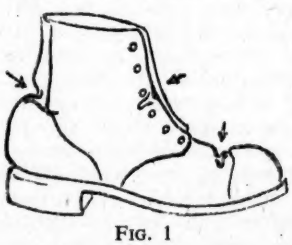


FIG. 1

important factor in making this crease, and the lower strap of the gaiter should always be quite loose when the foot is plantar-flexed. It would seem that the lesion is caused not by friction on the skin, which produces a blister, nor by pressure, which makes a callosity, but by repeated indentation. Since it is only seen in its typical form over a tendon, it would appear to represent the special response of paratenon tissue to this type of trauma.

Pathology

The established nodule is seen, on section, to be a mass of simple avascular fibrous tissue with a very few inflammatory cells. No abnormality of tendon or tendon sheath could be found in the specimens available, but the paratenon fatty tissue was largely obliterated. The skin showed only a little keratinization—within normal limits for the areas concerned. The specimens were from chronic cases. In recent cases there are, clinically, hyperaemia and slight oedema.

Treatment

Removal of the cause is all that is necessary to effect a cure in most cases. If the trauma is discontinued the lumps get smaller and the redness and tenderness rapidly disappear. But there is a marked tendency to relapse, and recurrence is certain if the patient returns to the same boots without dealing adequately with their faults. The boots must be eliminated, softened, or stiffened, according to the indications.

If new boots are supplied the soldier should be warned against softening the back, which should remain stiff and creaseless. He should be told to leave the lower strap of his gaiter quite loose. He should avoid lacing the boots tightly above the ankle, in order that a fold shall not form at the back. If a crease has formed at the back of the boot, softening seldom helps, and it is best stiffened with a small tin splint such as that illustrated (Fig. 2). This functions by curving

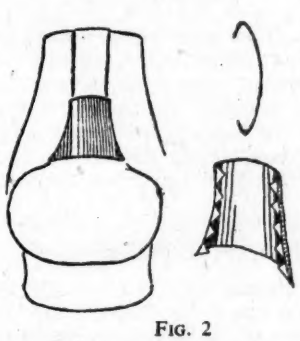


FIG. 2

FIG. 3

the leather from side to side and so making it more rigid. The splint may be quite thin, and is easily made with an old pair of scissors out of a cocoa tin. The edges are toothed and turned in as shown, so that the appliance will clip on to the back of an Army boot.

If a crease has formed just behind the toe-cap and caused peritendinitis over the base of the hallux it is probable that the boots are too long. A crease is also liable to form here when the soles are becoming too pliable and the boots need resoling. Boot trees, or packing the boots with paper at night, help to prevent this crease. Once formed it can be treated by splinting with a patch of leather, or it may be made innocuous by thorough softening with oil. (Dubbin does not soften leather.) The best method, however, is to raise the crease off the foot by sticking a piece of chiropodist's felt about 3/16 in. thick inside the boot. This will often cause the leather to fold outwards instead of inwards.

When the lesion is over the tibialis anticus tendon and is caused by the lace, the soldier should be taught to lace his boots as in Fig. 3, so that the laces do not cross the tendon beneath the leather, but only in front of it. Soft laces should be substituted for leather ones. Lastly, a strip of chiropodist's adhesive felt should be stuck inside the tongue of both boots.

Patients should be excused boots altogether until the area is no longer red and tender, though marching may be allowed in any other footwear that does not cause pain. I am not convinced that any local treatment affects the rate at which the lesion settles, but various counter-irritants are sure to have supporters. Injection of novocain round the swelling is a good first-aid measure, and is invaluable if the symptoms come on during a long operational march, but it will not cure the condition. Injection *into* a developed nodule is impossible.

In a series of over 20 cases I have seen only one man who has been permanently unable to march in Army boots. He had strikingly prominent tibialis anticus tendons, and I could devise no method which gave him adequate protection short of leaving the boots completely unlaced. One other man was down-graded for this condition, as we could not get him up to the marching standards of the division. Both these men could march well in shoes, as can many others who are poor performers when their ankle-joints are splinted by boots.

I have on one occasion excised the nodules on a very chronic case, but it is difficult to get the scar out of harm's way, and the psychological effect of surgery was bad.

I am indebted to my A.D.M.S., Col. M. MacEwan, D.S.O., O.B.E., D.F.C., for permission to publish this article.

INDUSTRIAL MEDICINE

A COLLEGE OF PHYSICIANS REPORT

Nearly three years ago the Royal College of Physicians of London set up a Social and Preventive Medicine Committee with a wide reference. The committee began its work by considering social medicine from within the hospital, on which it published its first interim report. Then it began the task of investigating social medicine outside the hospital, taking, as the first and most obvious field, the role of medicine in industry. It is with this subject that a second interim report deals.

The demand is made by the committee which has drawn up the report that the industrial health service should be planned in a bold manner, without much regard for traditional arrangements. It should be part of the projected National Health Service, with the ultimate responsibility vested in the Minister of Health. In the regional organization of the service the universities should play an important part, and here the recent endowment by the Nuffield Foundation of three university departments in industrial medicine provides an excellent example

The Present Unequal Provision

Medical services apply at present only to a small proportion of industrial workers at their place of work. Nearly all the whole-time medical officers are attached to organizations employing over 1,000 workers; yet—at all events before the war—more than half the workpeople in this country were employed in factories in which fewer than 250 operatives were working, and in only a few such industrial establishments was there medical supervision even by part-time officers.

A quarter of a million establishments are covered by the Factories Act, 1937. To-day there are nearly 200 whole-time and 700 part-time works doctors. Some of the part-time works doctors are also examining surgeons, of whom there are over 1,700, but most of these do not carry out personal medical treatment. The medical side of the factory inspectorate has developed slowly, and there are now only about sixteen medical inspectors, who act more or less as a small body of consultants in addition to their routine duties.

Beyond the territory of the ordinary provisions of the Factory Acts there are, for example, the workers employed in offices and business establishments, in hotels and catering organizations, in transport services, in temporary constructional works, and in a considerable section of agriculture, and all these occupations have their health risks. The report holds that the immediate requirement is for a comprehensive health service which will cover these "outside" industries and will apply to small concerns as well as large.

The family doctor has a vital part to play in such a service as a part-time industrial officer, and, says the committee, he must be trained for this function. There must also be a national service of medical officers of consultant rank who have specialized in the problems of occupational disease.

A National Industrial Health Service

The industrial health service will be concerned primarily with the working environment. Its duty will be to see that the individual is fitted into his setting; for this purpose a knowledge of his physical and mental capacity will be necessary. This will pertain not only to the people entering industry for the first time but to workers passing on from one occupation to another on account of recent or persistent illness. Another function will be the prevention of occupational disease, a task calling for the help of clinical consultants and scientific research workers. The prevention of injuries, the co-ordination of health and safety measures, the organization of a service of general health supervision and emergency treatment of illness and accident, and aid in rehabilitation, the final stages of which must be carried out at the place of employment, are all tasks which will fall to the service. To these must be added the resettlement of permanently handicapped workers, whose case calls for the same continuity of medical care and linking together of services as does the rehabilitation of those who return to full earning capacity.

The report also suggests joint management–labour committtees to arrange for the health education of the workers, the dissemination of information, and the collection of problems requiring study. The service would provide instruction in and technical study of lighting, heating, ventilation, welfare organization, and the nutritional aspects of works canteens. Finally, the work done in the industrial field would need to be integrated with the other medical services of the area, provided by general practitioners, hospitals, and specialist units.

Finance and Appointments

The committee brushes aside any objection that industry cannot afford a health service; it cannot afford to be without one. The most obvious way of financing the service would be for industry to pay for it, but the workers would be suspicious of medical officers in the pay of the management; moreover, elaborate pooling arrangements would be necessary for small undertakings. If a close relation between the national and the industrial health service is maintained, payment might be part of the general health budget. Alternatively, the cost of the service might be met by a levy on output or profits. Some combination of two or more methods might be considered, and the possibility of sharing the costs between industry and central funds might offer a satisfactory solution.

One method of making appointments to the service would be through the Local Health Services Councils as outlined in the White Paper, provided industrial representatives were included among its members. The ultimate aim in training is a much better grounding in industrial medicine for medical students intending to take up general practice; meanwhile, with a view to part-time services, short courses should be arranged, lasting about six weeks, combined with refresher courses from time to time. For the man who wishes to make industrial health his career, it is considered that a special well-designed course lasting one year should be undertaken, to be preceded by at least two years' postgraduate experience in medicine, of which not less than one year should have been spent in general practice.

A diploma in industrial health would help to establish a minimum standard of training and qualification, but this must await a study of the general question of postgraduate diplomas. For consultants and specialists in industrial medicine there would be required a period of three years of specialist work, including a junior post in a university department, some experience in research, and possibly some experience abroad. The committee holds that research in industrial health should be given every administrative encouragement. The Industrial Health Research Board must continue, and there should be departments of industrial health in university teaching centres, while in each local administrative area a division for field investigation, working in close touch with the Industrial Health Research Board and the local factories department on the one hand and the university and local industries on the other, would be desirable.

In the Government White Paper on a National Health Service industrial medicine is treated only in one short paragraph and to a rather greater extent in one of the appendices, but only in the form of a statement of the present position. The R.C.P. Committee has filled a very obvious gap.

Reports of Societies

DEVELOPMENT OF HEALTH IN ADOLESCENTS

The meeting of the Section of Medicine of the Royal Society of Medicine on Jan. 23, with Dr. GEOFFREY EVANS in the chair, was devoted to the subject of the physical training of adolescents. A film was shown of the methods and results of the physical development centres for substandard Army recruits.

Brig. FRANK HOWITT said it was curious that the medical profession, with its tendency to specialize and departmentalize in every direction, had paid so little attention to the problems of adolescence. Before the war anyone who came forward with a demand for attention to national physical fitness incurred the charge that he was preaching militarism. The adolescent had no political foster-parent, but lay in the no-man's-land between the Ministries of Health and of Education. Thus there developed a tendency on the part of the masses to spend their leisure in watching contests rather than taking part in them.

It was the good fortune of Army physical medicine, which looked upon itself as part of general medicine, to be entrusted with the selection of cases for the Army physical development centres, their medical control at the centres, and their final assessment. At the centres both preventive and corrective treatment were directed to meet the specific demands of the Army. The aim was to produce by exercises and supervision a correct habit of posture, locomotion, and performance of physical tasks, while the necessary mental stimulus was provided by games and competitions. Individual treatment was given where required, and the masseur, the chiropodist, and the dentist each had his function. Routine medical examinations were held at the beginning, middle, and end of the course. A centre had been established for substandard recruits of the A.T.S., and although no great muscular development was aimed at in their case it was remarkable what improvement was effected in stance, appearance, and general health.

One of the chief difficulties in the future under any scheme for the training of youth would be the question of compulsion. In peacetime persuasion would be required, and persuasion was dependent on motive. The appeal to youth must be pragmatic and practical, even selfish, based on self-advancement and increase of personal prestige. Finally, in teaching hospitals there should be a preventive as well as a curative department, to which should be referred all substandard conditions, fatigue states, anaemias, recurrent infections, and early structural deviations—conditions which were sometimes foolishly referred to as minor maladies.

Army Experience and Testimony

Major-Gen. Sir GUY DE C. GLOVER said that his Army experience of physical training exercises went back to the last war, when he was for a short time with a division made up of "bantams." Not only were disabilities improved as a result of physical exercises but there was a change in the entire mental attitude of the man. The War Office was so impressed with this that in due course the first physical training centre was started at Aldershot, and, at one time, of 2,300 men who had been through the course there, 2,000 had been upgraded and had become useful in the Army. During the present war several physical development centres were started. It was found preferable to make them actual Army units under a commandant, because then the men felt that they were really soldiers and not convalescents. There were, of course, also a large number of convalescent depots where similar exercises were carried out, but these were for men who had been wounded or sick, whereas the physical development centres were of a preventive character, and men went there immediately on joining the Army. Up to the present time 27,000 men had been put through the courses, and 20,000 had emerged as thoroughly efficient soldiers, benefiting not only in physique but in intelligence, and acquiring pride in themselves. In fully 50% of the cases there had been a gain in intelligence as well as in physical qualities, and the more intelligent the men to begin with the more strikingly the intelligence developed. "These centres," said Sir Guy Glover in conclusion, "are invaluable to the Army."

Effect of Competitive Exercise

Sir ADOLPHE ABRAHAMS spoke on the influence of competitive exercise. The familiar accompaniments of severe physical effort, he said, provided a prima facie case for its condemnation. The appearance of distress and suffering, the occurrence of exhaustion and collapse, all contributed to the conviction that injury to the vital structures could hardly be avoided. Admittedly the stress upon the circulation was severe. Nearly 40 years ago, in a letter to the public press, half a dozen eminent members of the profession condemned cross-country running for boys. Their opinion was warmly challenged, and the Association of School Medical Officers, after due investigation, came to the conclusion that there was no ground for alarm. At a later date Dr. L. R. Lempriere, medical officer at Haileybury, brought forward the collected experiences of himself and other school medical officers, covering 16,000 boys, showing that in 30 years, excluding a few genuine accidents, only one death on the football field could be recorded, and even in this there was no evidence of a lesion which might be attributed to exertion.

It was confidently maintained by leading cardiologists that the reserve of a healthy heart was so considerable that no effort, however great, could produce any harmful effect. When the call was excessive it was other, less important, factors which failed. The heart was not, as was frequently implied, an isolated organ working by itself. It represented the central fortress of the organism, the defending position and outposts being provided by the nervous system and its servants. When alleged cases of heart strain were examined it was found that some were examples of long-standing lesions, which, having given rise to no symptoms, had been unrecognized until the breakdown; some were merely instances of innocent natural peculiarities mistaken for pathological conditions; and some —the majority—were the symptoms of nervous instability, with special relation to the vasomotor system, particularly in respect to the lability of puberty, when so many demands upon energy were simultaneously made through the exigencies of growth, the integration of the endocrines, the mental pressure and anxiety over examinations, and the like.

The idea of adolescent strain to some conveyed the impression of a limited store of energy, specially inherent in the heart, which was provided for the whole of life for prudent expenditure and might be prematurely exhausted by spendthrift living. The failure of schoolboy prodigies to develop in accordance with their early promise was regarded as evidence in support of this idea, especially as it provided a convenient excuse for prophetical failures; while the "burnt-out athlete" was left with the reputation of martyrdom. The true explanation rested on the fallacy of regarding growth and development as subject to a universal law instead of as an individual problem. Often the "curve" of athleticism rose rapidly to its peak, and then, after remaining horizontal for a variable period, progressively declined.

Of the girl athlete Sir Adolphe Abrahams said that, with appropriate modifications, the same physiological and pathological considerations would apply. He refrained from any detailed consideration for three reasons: he had had very little personal experience; the cult of competitive exercise was, speaking generally, less applicable to girls; and the physical well-being of schoolgirls had for some time been organized on a scale that might well be followed in the case of boys. It might smack of Victorian narrow-mindedness to display solicitude for the preservation of those qualities which were traditionally associated with femininity, for the avoidance of the danger of over-development of certain masculine traits by indulgence in severe competition, not to mention the disadvantage of diverting energy from channels for which it was particularly required in preparation for the burdens of womanhood and possible motherhood. Special investigations had decided that there was no evidence to support the fear that muscular development prejudiced normal pregnancy and parturition, although some gynaecologists remained unconvinced. The nervous side, however, deserved paramount consideration. Highly competitive efforts such as first-class lawn-tennis tourna-

ments, in which the leading players attained a wide publicity, had the disadvantage not only of creating a wrong sense of values but of producing an anxiety state and general ill-health which were not so much the direct consequence of exertion as of the concomitant circumstances.

The Public School System

Dr. G. E. FRIEND (medical officer of Christ's Hospital) said that the development of health in adolescence depended upon four main factors: (1) the provision of an adequate and well-balanced diet; (2) adequate sleep and rest; (3) properly balanced physical development, which in turn depended on a proper ratio between games, physical training, and education; and (4) avoidance of over-fatigue. The chief function of the school medical officer was preventive rather than curative. He agreed that the average youth required a motive to make the necessary effort for his physical development. He had himself conceived the idea that the Greek ideal of perfect physical development and fitness was the right motive to inculcate, provided it was suggested to him as development purely for its own sake. Boys hated to be thought altruists. The J.T.C. and A.T.C. and other semi-military pursuits in school at the present time were unpopular with the majority of the boys, not because the boy was not patriotic but because the duties of the course were compulsory and took time from games. Competitive games and sports were character-forming. Military activities would be much better if they could be amalgamated with something on the lines of the Boy Scouts—that is to say, there should be less marching and forming fours, and more physical training and week-end camping, also more first-aid and more field work such as engineering and signalling.

In some further discussion Sir MORTON SMART said he was pleased that at last there had been some co-ordinated effort for the training of the adolescent. In the Army and Air Force there were unquestionably great opportunities for this, which were not likely to continue when peace came and the majority of the men in the Services were released. If a start could be made at school and training be given in the pre-adolescent stage the whole matter would be more or less simplified. Dr. ROBERT SUTHERLAND spoke to the same effect. One of the most useful contributions which could be made would be to discover appropriate preventive measures to be applied to the pre-adolescent, so often the helpless victim of circumstances.

EFFECT OF DIET ON INDUSTRIAL POISONING

A number of foodstuffs have from time to time been supposed to ameliorate the effect of industrial poisoning. The principal favourite among these is milk. When, however, the scientific basis for the administration of specific foods as a protection against poisoning is considered, very little proven information can be found. At a meeting of the Nutrition Panel, Food Group, of the Society of Chemical Industry on January 16, Dr. H. Taylor of I.C.I. suggested that the best means to avoid industrial poisoning was to take steps to prevent work-people from being poisoned at all. This advice was confirmed by Dr. R. E. Lane, Dr. Merewether, and other speakers at the meeting. Dr. TAYLOR, who opened the discussion, mentioned a number of foodstuffs that were thought to be protective. The first, of course, was milk, but whether its alleged protective action lay in the calcium it contained, the methionine, or the riboflavin, could not be stated. Vitamin C was also a nutrient popularly supposed to protect the blood-forming organs against injury by toxic solvents; and German work, published, it need hardly be said, before the war, recommended a daily diet including 18 oranges and 18 lemons as suitable for workers exposed to such risks. Dr. LANE discussed some of the aspects of lead poisoning, and he emphasized that absorption through the lungs was probably ten times as dangerous as absorption by any other route. For example, lead passing into the alimentary tract might not be absorbed at all, and if it were absorbed it might be excreted in the bile before harm had been done. Even after absorption a portion of the lead might be re-excreted comparatively harmlessly and another portion might be tied up in the bones. In attempting to prevent lead poisoning a number of dietary factors have been suggested; one of these is pectin. Milk is advised sometimes merely to occupy the gastric juices, sometimes for its high calcium content. At other times low-calcium diets are recommended in an attempt to prevent the storage of lead in the bones. Copious amounts of water are also recommended to protect the kidney, and the diet should be designed to prevent constipation, and hence to assist the excretion of lead from the alimentary tract. Although Dr. Lane mentioned all these different dietary possibilities, the suggestion which he made, and in which one could gather he himself was best convinced, was that in order to prevent lead poisoning a good prescription was to pay high wages, employ intelligent work-people, provide them with a good supply of drink—whether it be tea or water—and, after all this, perhaps provide them with milk.

The increased resistance to industrial poisoning of people in this war as compared with those of the last was mentioned by a number of speakers. This could be attributed perhaps to better living conditions, perhaps to better diet, or perhaps to the fact that in this war fewer young people were employed in hazardous work than had been the case in the last. Prof. HIMSWORTH mentioned the different susceptibility to liver damage of different strains of rats, and wondered whether this might, in part, also explain the different susceptibilities of work-people. He also pointed out the general similarity of the symptoms due to poisoning—for example, by selenium—and those due to certain types of nutritional deficiency. It was an attractive and plausible hypothesis that poisons interfered with one or other parts of an enzyme system, and perhaps the hope for future development of dietary treatment to prevent poisoning lay in discovering which these parts of the system were and providing high amounts of the substances involved in food. Mr. A. L. BACHARACH, from the chair, referred to work on selenium poisoning, in which, by means of labelled molecules, it had been shown that selenium took the place of sulphur in the methionine molecule, and hence caused what might almost be described as a conditioned protein deficiency.

From all this discussion and more it was made plain that much could be hoped for in the future from a scientific study of the nutritional prevention of industrial poisoning. At present, however, many of the methods used and, in particular, the wholesale prescription of milk, could not be justified on scientific grounds. All speakers, however, were agreed that to obtain the best chance of protection, work-people exposed to toxic substances should be given the best balanced diet possible.

Nova et Vetera

MEDICAL EPONYMS

The medical student at the outset of his career is confronted by a number of diseases, symptoms, and treatments to which are attached the names of hitherto unfamiliar persons. Recently there has been a plea for the dropping of such labels, but many would regret this departure from tradition, though when four names are attached to the signs of exophthalmos one may well feel it is time to call a halt. It was a happy idea of Mr. HAMILTON BAILEY and Mr. W. J. BISHOP, in their *Notable Names in Medicine and Surgery* (H. K. Lewis; 15s.), to give a brief account of 83 persons, including two women, whose names are associated with some discovery. It is also an added advantage to have a portrait of each with an illustration or diagram elucidating their contribution to the subject. The authors lay no claim to completeness, but others besides students will glean many interesting facts from these pages. Thus we are informed that Meckel's diverticulum was described by the grandson of the discoverer of Meckel's ganglion. Three general conclusions will be drawn by the reader: first, that a man's name may be attached to quite an insignificant part of his general contribution to medicine—thus Heberden though very little of the nodes by which he is generally remembered rather than by his rationalizing of pharmacology; secondly, the enormous sterile interval between Galen and the 16th century; and, thirdly, the international character of medicine which recent political events have done so much to endanger

Correspondence

Neglected Children

SIR,—Your leading article on neglected children (Jan. 27, p. 124) is most gratifying. For over a year I have been trying to arouse interest in the problem of neglected children. Since I brought this problem before the local branch of the Council of Social Service they have been most helpful, and some progress has been made in the face of fearful difficulties. We have recently had letters published in most newspapers, although one or two—typical, perhaps, of the general apathy and official indifference—have not published our communications. It may be that they thought our descriptions of local cases of neglect and squalor too loathsome to publish. One M.P., indeed, asked us not to print some of the details because of the damage which might result to our national prestige!

In the two Doncaster courts since Dec. 2 last I have personally given evidence in 14 cases of gross neglect involving 68 children. There are many more cases in this district (and we do not think that ours is an unusually bad one) which ought to be brought to light, but magistrates and the N.S.P.C.C. are up against a tremendous difficulty. There is practically nowhere to put these children while their parents undergo any sentence for their gross neglect. Furthermore—and this is a great deal more important—when the parents are released the children have to be returned to the appalling homes from which they have been temporarily rescued, there to be "looked after" by now embittered parents. The children's homes are all full and have waiting-lists. One home has lost 2,000 beds to a Government Department. This lack of provision for neglected children is, apart from the humanitarian aspect, a great waste of the nation's most precious asset—healthy and fit children.

I cannot take up space explaining why foster parents are not the answer to this problem. Local authorities are, naturally, very prone to say they are. If they were, much expense and difficulty would be easily overcome. What is needed, and very urgently, is the provision of many more beds in well-run children's homes. There are many empty premises in the country to-day under the control of different Government Departments; there are many civil defence workers not required any longer for C.D. duties. If only the need could be realized the staffs and the homes could be provided. The Ministry of Health, the Board of Education, and the Home Office are all involved, and are all apt to blame one another.

There is shortly to be held a Parliamentary inquiry into the management of children's homes. If readers could persuade the Ministries concerned to hear evidence on the dire need for more homes they would have done a great service to the country. It is probably true to say that many thousands of children are at present being reared in conditions worse than in an average stable. Yes, this is literally true if unpalatable. Help in bringing this fact to notice is urgently needed. I can willingly give anybody asking for them exact reports of scores of almost unbelievably shocking cases.

Dr. A. E. Martin, according to your leader, stresses the need for adequate supervision of these cases by the local authorities. I wish I had space to emphasize the value of this observation. I must apologize for having taken up so much print already, but this problem concerns one of the most serious blemishes on our social services, and there is no room for any complacency. We are all busy, but not too busy to help in this matter.—I am, etc.,

Doncaster. ROBT. W. L. WARD.

Nature of Injectable Liver Extracts

SIR,—The article by Messrs. W. B. Emery and W. J. Hurran on injectable liver extracts (Jan. 20, p. 75) is both interesting and timely. It is good that attention should be drawn to the advantages which would result from the establishment of an official unit of activity. The authors have mentioned some of these, but have omitted the very important fact that it would bring to an end the marketing of liver extracts possessing little or no potency. How frequently this occurs one can only guess, but from my own experience I should say that it is certainly not rare. Since I have seen several severe remissions of pernicious anaemia due to the use of such extracts, I think it quite likely that some deaths have resulted from the same cause. Great accuracy cannot yet be claimed for any method of assessing the potency of liver extracts, but even an approximate estimate is better than none at all.

If, as I earnestly hope, some official action is taken in this matter, the system of units to be adopted will have to be decided upon. It will be unfortunate, I think, if different countries adopt different standards. The U.S. have defined a unit of potency; Canada has followed suit with a slightly different definition; and now Emery and Hurran have proposed a third. Since the accuracy of any of the methods is probably not great, it would seem essential to use one system if the results are to be comparable.—I am, etc.,

University of Aberdeen. HAROLD W. FULLERTON.

Management of Colitis

SIR,—In the *Journal* of Aug. 26 (p. 278) there appeared a review of my monograph, *The Modern Management of Colitis*, which contained some rather surprising statements. The reviewer apparently objected to our inclusion of cases of tuberculous colitis, amoebic colitis, and the colitis due to the venereal lymphogranuloma in a discussion of ulcerative colitis. This is most unusual, for are not all these conditions infections of the large intestine? He states that "about 250 cases of ulcerative colitis enter the Clinic each year." He has been considerably misinformed in this regard; for many years we have seen many more patients with ulcerative colitis than this annually, and in 1943 we saw 520 patients with ulcerative colitis of the Types 1, 2, and 3 alone. No attempt was made to completely cover the literature on ulcerative colitis, nor would I consider this indicated in a volume of this type. An attempt was made to select a few authors representing the various views concerning aetiology. I think the reviewer is correct in suggesting that there was little advance in the subject of ulcerative colitis between the early papers and the one by Dr. Logan published in 1919.—I am, etc.,

Mayo Clinic, Rochester, Minnesota. J. A. BARGEN.

Nursing of Tuberculosis

SIR,—Your annotation (Oct. 28, p. 569) and the recent letters from distinguished authorities on tuberculosis show that, although there is no indifference to the problems connected with the nursing of tuberculosis, there is considerable divergence of opinion on the risks and dangers which that occupation involves. In fact, it would seem that the more that is written on the subject the greater the confusion becomes. This is not surprising in view of the paucity of accurate information on the fate of the primary lesion in young adults.

There is no doubt that tuberculosis is an infectious disease; nor will it be disputed that primary lesions are discovered in the frequently examined nurses during their course of training, but there is no proof as yet that as a profession they are more vulnerable than other selected classes of the population of the same age group. Neither is it certain that those nurses who develop active tuberculosis do so because they have been nursing tuberculous patients.

From the evidence of our village settlements for the tuberculous, where so far children brought up in tuberculous households have not developed active tuberculosis, we may assume that environment, mode of life, and medical supervision are the important factors that decide the future of the primary lesion. Would it not, therefore, be wiser to concentrate on the improvement of these factors in our hospitals and sanatoria rather than argue on the risks of infection?

With further development of the valuable work being done under the Prophit Bequest, we may, five or six years hence, be able to lay down with some degree of certainty the conditions of service in the nursing of tuberculosis. Until then let us see that no criticism can be made regarding the provisions for the general welfare, education, and medical supervision of our nurses, irrespective of the type of institution in which they may be working. By such action we shall do more to dispel the fear of infection and fill the depleted ranks of the

profession than by advertising present inconsistencies of policy due to our incomplete knowledge of the dangers of nursing tuberculosis.—I am, etc.,

Public Health Department, County Hall, S.E.1. FREDERICK HEAF.

SIR,—In reply to the criticism of Drs. P. W. Edwards and A. Clark Penman (Jan. 20, p. 95) of my letter on tuberculous infection in nurses I should like briefly to make the following points.

I quoted the figures of Daniels (the numerical misprint was corrected in one of your subsequent issues) relating to tuberculous infection of nurses in general hospitals because the report of the Tuberculosis Association and Joint Tuberculosis Council was based on the impression—for there are no statistics in the matter—that tuberculous infection in sanatorium nurses was no higher than that in general hospital nurses. This is, to say the least, a negative attitude, and when it is proved by Daniels that Mantoux-negative nurses in general hospitals have a high tuberculosis morbidity the case for employing such nurses in a tuberculous environment falls to the ground.

There are ample further statistics available from America and Scandinavia on the subject supporting my contention, but I need quote only those of Hansen (1943), in a paper read before a meeting of the T.A., showing that 27 cases of tuberculous illness occurred among 625 cases of Mantoux-positive nurses, whereas 96 cases occurred among 280 Mantoux-negative at the Municipal Hospital, Oslo. No death occurred in the positive group, while 11 deaths occurred in the negative group of half its size, which does not support the view of Drs. Edwards and Penman on the benign nature of primary tuberculous infection in young nurses. The truth, clearly indicated in the last paragraph of their letter, is that the laudable desire to keep beds open has blinded the authors of this report to the statistical evidence. It is all the more unfortunate, therefore, that these views should receive favourable notice in your editorial, which, of course, has wide publicity and is likely to be considered authoritative.

The problem can, and probably should, be approached from another angle—namely, by B.C.G. inoculation of Mantoux-negative nurses. I believe that hundreds of thousands of persons have now been inoculated without a single case of progressive tuberculosis developing—the often-quoted Lübeck disaster of 20 years ago being due to mixing of cultures. In this connexion it is interesting to note that after hearing the paper by Hansen (already quoted) the T.A. were so impressed by the possibilities of B.C.G. vaccination that they passed the following resolution: "That the T.A. Council be instructed to approach the councils of the National Association for the Prevention of Tuberculosis and the Joint Tuberculosis Council with a view to a joint request to the Minister of Health to make B.C.G. available for trial in this country." It would be interesting to know what further has occurred as a result of this resolution.—I am, etc.,

Kinmel Hall Hospital, Abergele. W. E. SNELL.

SIR,—It should surely be possible to collect reliable figures as to the incidence of tuberculosis among nurses in general hospitals and in sanatoria. Any one of the big counties would have comparable institutions in which a statistically significant inquiry could be undertaken. All the evidence at present available points to a very considerable risk of infection, and most nurses certainly believe that there is great danger in this work. We know that Mantoux-positive reactors are less likely to acquire the disease, and it would be ideal if negative reactors could be excluded from tuberculosis nursing. I cannot, however, agree with Drs. Edwards and Penman (Jan. 20, p. 95) that "a sanatorium is as good a place as any other in which to acquire tuberculin sensitivity." Intermittent exposure in general hospital ward, cinema, or public transport vehicle must on theoretical grounds offer a better chance of building up an immunity than does massive exposure.

At the present time I know of no compensation scheme for nurses—or doctors for that matter—who contract tuberculosis in the course of their work, and thus lose their careers and perhaps even their lives. If the risk is as small as some would have us believe, then adequate compensation would not be very expensive, but if the risk is genuinely great, then financial security should be offered at any cost. Routine *x*-ray and tuberculin control should mean that only healthy subjects are employed in the first instance, and that if they develop tuberculosis it has been acquired during the period of their service. The staff requirements of hospitals and sanatoria are well known, and I would not wish to see them aggravated in any way, but in fairness to the nurses the facts should be honestly faced.—I am, etc.,

London, W.1. ALEC WINGFIELD.

SIR,—The risks which face any girl who takes up the nursing of tuberculous patients are serious enough even under the best possible conditions and with the greatest possible care. Are we sure that all safeguards which can be used to protect nurses from contracting tuberculosis *are* being employed?

I have recently been consulted by two probationers from two separate sanatoria. One told me she had arrived at her hospital as a raw recruit at midday and by teatime was on duty in a tuberculosis ward without any instruction whatsoever in methods of protecting herself against infection. When I saw her she had an acute tuberculous bronchopneumonia. The other probationer told pretty much the same story—of emptying sputum mugs, etc., without any preliminary advice, not even to wash the hands after this necessary but odious duty.

These girls were not trained nurses who could be expected to think for themselves, but girls completely ignorant of such things as asepsis and antisepsis. Each was employed by a local authority in different parts of the country. If their stories are true—and I have no reason to doubt them—do they not call for drastic revision in the ideas of some medical superintendents? We cannot expect more girls to come forward as candidates for this hazardous branch of nursing until they and their parents are assured that proper safeguards will be taken against infection.—I am, etc.,

Leicester. T. F. BOSTOCK.

Necessities for Very Sick People

SIR,—There is a crying need for some body of experts who could, *without* delay, authorize and obtain necessities for very ill people when such necessities were properly vouched for by the medical man or men in attendance. At present there is none. Let me give you an example.

I have a patient suffering from carcinoma of the stomach with peritoneal metastases. Alcohol in some form, preferably whisky, alone sustains the patient and gives sleep. Though both I and the doctor in attendance have certified the necessity no spirits of any kind can be obtained in the town where the patient lives, and the case is dependent on kind friends who, out of their own small supply, give a small quantity at irregular intervals.

The patient suffers continual abdominal pain, which is relieved by a rubber hot-water bottle on the abdomen. The one rubber bottle in the house was worn out and leaked. I certified to the Ministry of Health the need for an authorization to get a new one via the firm which, having such bottles in stock, would supply it if allowed to do so. That was some 3 weeks ago, and by Jan. 22 the matter was still under consideration (or shelved, or pigeon-holed!), and I have had no further communication since. There is a certain callousness about these Government Departments which justifies the worst fears of those who oppose medicine becoming one of them.—I am, etc.,

London, W.1. VICTOR BONNEY.

The Etherington-Wilson Method

SIR,—I cannot let Mr. Thomas Moore's suggestion (Jan. 27, p. 129), that surgeons and anaesthetists who practise this method are careless and imprudent, pass unchallenged. Excluding the grosser errors due to ignorance and inexperience, the improper selection of cases for spinal analgesia is the decisive factor in producing fatalities. Babcock, in whose clinics spinal analgesia had, in 1938, been used upwards of 40,000 times, states: "If a writer reports fatalities, he also reports his personal incompetence."

I have used the Etherington-Wilson method for obtaining high blocks ever since its introduction, and lately his recent modification (*Proc. roy. Soc. Med.*, 1944, **37**, No. 9, 545),

with great satisfaction in conjunction with no less eminent a surgeon than that brilliant technician, the late Mr. Cecil Joll. We had no immediate mortality attributable to spinal analgesia, nor did we ever encounter a case of respiratory paralysis due to involvement of the phrenics; this statement can be verified by our case records, which are available for inspection. Fatalities will be found to be associated with the abuse, not the use, of this simple and accurate method for obtaining a high spinal block.—I am, etc.,

Aylesbury. H. W. LOFTUS DALE.

Civilian Respirator as Anaesthetic Mask

SIR,—As one who, in common with Dr. J. Morland Smith (Dec. 23, p. 820), deplores the present-day desecration of Dr. Clausen's originally excellent harness, I was extremely interested to read Dr. F. S. Vaughan's account (Jan. 27, p. 131) of a civilian respirator converted for use as an anaesthetic face-piece. It would be interesting to know whether he finds the inevitable increase of dead space, occasioned by having the expiratory valve at a distance from the face-piece, any disadvantage. Also, if he uses it only for closed-circuit anaesthesia, and whether under these circumstances he finds there is a "build-up" of carbon dioxide in the extra piece of corrugated tubing.—I am, etc.,

King George Hospital, Ilford. MARGARET JOAD, Resident Anaesthetist.

The Medical Film

SIR,—The Scientific Film Association welcomes the attention that was drawn in the leader of Jan. 20 (p. 87) to the present lack of suitable films for medical education. The association, while possibly not in agreement with all the criticisms therein, would point out that the correction of the deficiencies referred to is one of the main objectives of its work through its Medical Standing Committee.—We are, etc.,

W. MCADAM ECCLES, Chairman
S. J. REYNOLDS, Hon. Secretary,
Medical Standing Committee.

Scientific Film Association, 16, Princes Gate, S.W.7.

Aggressive Impulses in Progressive Society

SIR,—While fully endorsing Dr. A. C. Wilson's contention (Jan. 20, p. 96) of the fundamental role of exploitation in various forms in the creation of antisocial unhappiness, and while in complete agreement with him in the first and final paragraphs of his letter, I would like to point out that there is a growing body of psychiatric opinion of a predominantly environmental rather than biological orientation. Such psychiatrists consider that aggressive tendencies are not inherent and inevitable, but are the result of suppressed resentment and hostility in early childhood, and that there must be a "build-up" before there is a breakdown. What is normal and natural in human beings is self-assertion, the "standing up" for the right to live in as happy and reciprocal a conjunction with others as is possible. An important function of psychotherapy is not the discharge of aggression into thin air, so to speak, but the alteration of the force behind it through understanding and insight to a healthy self-assertion and a real self-esteem. Thus, for what Dr. F. E. Williams terms "normal aggression," the concept of adequate self-assertion and true self-evaluation could be more satisfactorily and usefully substituted. Nature indeed is red in tooth and claw, but humanity in the exercise of an evaluating and discriminating consciousness need not necessarily be so.—I am, etc.,

Morpeth. L. F. DONNAN.

Artificial Insemination

SIR,—The writers of the article on artificial insemination have caused an angry eruption on your fair pages, but they have at any rate been instrumental in ventilating a subject on which sooner or later some decision must be reached.

Is insemination with donated semen an ethical proceeding? Many doctors would appear to believe that in all cases and in all circumstances it is inherently immoral. Ethical decisions rest on feeling rather than on argument, and those who believe insemination to be wrong are entitled to their opinion. But to support such an ethical decision with arguments based on the imagined psychological consequences to the parties chiefly involved only weakens the case against insemination. In actual practice the emotional attitude of these parties to the proceeding is quite different from what many of your correspondents would expect it to be. It would be wiser, therefore, for the opponents of insemination to confine their attention to the ethical aspects of this subject.

I have always felt that in the age-long dispute between the vivisectionists and the anti-vivisectionists Mr. Bernard Shaw stood on the firmest ground when he stated simply that knowledge could be purchased at too great a cost, and that the knowledge gained from vivisection was an example of this. Those who have fallen back on the argument that the information to be obtained from animal experiment was misleading and of no value to medicine merely discredited the case against vivisection. So also does such a correspondent as Dr. F. M. R. Walshe obscure the issues when he writes: "It is difficult to argue with the advocates of this latest novelty in techniques offered to the community, for they seem to have no clear ethical principles and, we may be sure, will be disdainful of those that have." Fortunately we live in a country in which the right is accorded to everybody to have and to express freely their ethical principles. Surely it should be possible for medical men to reach some understanding on this highly controversial subject without discrediting the motives of their fellows? Voltaire once said: "I entirely disagree with your opinion, but I would willingly die in defence of your right to express it."—I am, etc.,

London, W.1. KENNETH WALKER.

SIR,—Prof. L. G. Parsons (Jan. 20, p. 96) appears to be under some misapprehension with regard to the position of a child born as a result of artificial insemination. It is not an illegitimate child as he suggests, and quite clearly the doctor who performs the operation is in no way an accessory to any misdemeanour. Every child born of a married woman during the subsistence of the marriage is presumed to be legitimate, providing the husband and wife have had opportunities of access and neither the husband nor the wife can give evidence tending to disprove the fact of sexual intercourse between them. In those circumstances the child is quite properly registered as legitimate, though it is clear that there is a risk of a third party taking action to bastardize the child, but in that event it would be extremely difficult for that third party to bring the necessary evidence to the court.—I am, etc.,

Llanfairfechan. G. J. FINCH.

SIR,—I would be grateful if you would allow me to reply to the proposals published in the *Journal* on this subject: (1) Women not possessing a husband should be (I presume voluntarily) subjected to artificial insemination. (2) The intelligentsia should act as donors.

These proposals have filled me with horror and amazement. I am surprised that so little consideration has been paid in this controversy to the person most directly concerned—i.e., the offspring. Surely the strength of the nation lies not in its intelligence quotient *per se* but the spirit of its citizens—a spirit bred and fostered by home life and influences. An Englishman's home is his castle, and each home forms a unit which makes up the nation; but the children thus produced would have no home in the present sense of the word, since they would never know, and feel the influence of, their father. Admittedly, there are many children in the country to-day who have unfortunately never known their father if he died during their infancy; nevertheless his influence still pervades the household, since his life is held up to them as a model by their mother for them to emulate, and his memory is both revered and cherished.

Finally, one hears a great deal nowadays about "State control." Surely it is a degradation, and not a social advancement, to suggest that the population shall in future be organized into one vast stud farm?—I am, etc.,

Stoke-on-Trent. AUDREY ROBERTS.

Tapeworm in Freshwater Fish

SIR,—During 1944 two outbreaks of disease in trout, caused by infection with the plerocercoids of a species of *Diphyllobothrium*, were recorded. The first report (Duguid, J. B., and Sheppard, E. M., *J. Path. Bact.*, 1944, **56**, 73) gave details of an epidemic which occurred during 1942–3 in two

reservoirs in South Wales, and the second (Hickey, M. D., and Harris, J. R., *British Medical Journal*, 1944, **2**, 310) dealt with the occurrence of the condition in trout in the Dublin area.

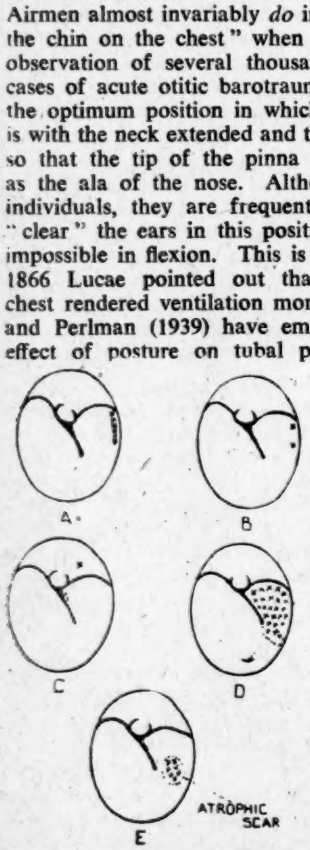
The purpose of this letter is to record a third, very mild, outbreak which came to my notice during the latter part of 1944. Diseased trout were first observed during the month of August in a reservoir in Northamptonshire, six dead trout being picked up between August 11 and 25. I was not able to examine any of these, and saw only a seventh trout caught on Sept. 24. Thirty-nine plerocercoids, showing morphological characters similar to those described by Duguid and Sheppard, were recovered from the peritoneal cavity of this trout, and these plerocercoids were fed to one guinea-pig and to three rats. No evidence of infection was observed in the guinea-pig, but all three rats passed eggs of *Diphyllobothrium* in the faeces for varying periods, and finally threw off the infection spontaneously. During the period when deaths were being observed in the trout fifty grebe also died, but it is not known whether or not the dead grebe were infected with *Diphyllobothrium*. Subsequently several lots of smaller fish, including species other than trout and totalling just over 100, were caught in the reservoir, and on examination 40% of them were found to harbour one or more plerocercoids of a smaller type than those recovered from the trout caught on Sept. 24. Attempts to infect rats by feeding these smaller plerocercoids have not, as yet, yielded positive results.—I am, etc.,

Veterinary Laboratory, Ministry of Agriculture and Fisheries, Weybridge. T. E. GIBSON.

Eustachian Obstruction and Barotrauma in Airmen

SIR,—The comprehensive article by Fl. Lieut. R. M S. Matthews on Eustachian obstruction and otitic barotrauma in air crews of heavy bombers, published in your issue of Oct. 21, 1944, is of such value that the following criticisms and comments are submitted with diffidence.

He states that to perform Valsalva's manœuvre "it is helpful to incline the head forward with the chin on the chest." Airmen almost invariably *do* incline their heads forward "with the chin on the chest" when asked to auto-inflate; but from observation of several thousand patients (including over 500 cases of acute otitic barotrauma) it has become apparent that the optimum position in which to achieve successful air entry is with the neck extended and the head slightly tilted backwards, so that the tip of the pinna is in the same horizontal plane as the ala of the nose. Although this "feels wrong" to the individuals, they are frequently surprised by their ability to "clear" the ears in this position after auto-inflation has been impossible in flexion. This is not an original observation. In 1866 Lucae pointed out that flexion of the head on the chest rendered ventilation more difficult, and Hartmann (1879) and Perlman (1939) have emphasized the importance of the effect of posture on tubal patency.



Your contributor's remarks on the importance of *visual* recognition of air entry into the middle ear should be stressed, as this is the most frequent and reliable present evidence of air flow into and out of a tympanum with an imperforate drumhead. Very slight outward movements of the drumhead become evident by the appearance of fresh light reflexes additional to the cone of light, and the usual situations of these are shown in the accompanying diagrams of a left tympanic membrane. Usually these light reflexes become visible close to the attached border of the postero-superior quadrant as linear (A) or pin-point (B) areas; less commonly the reflex becomes visible above and behind the short process of the malleus (C). Occasionally, and particularly if the lustre is poor, the whole posterior hemisphere may be seen to bulge outwards (D). This last movement may easily escape detection, and its occurrence may not be obvious until the subject swallows with the anterior nares occluded (Toynbee's manœuvre), when this segment of the tympanic membrane may be seen to move inwards. On scarred drumheads light reflexes may appear elsewhere, or an atrophic patch may be observed to bulge outwards (E).

The 2,000 ears mentioned by Fl. Lieut. Matthews, and in which air entry was visibly positive in 91.7% of cases, belonged to air cadets who had been fully instructed in Valsalva's manœuvre and one-half of whom had varying amounts of flying experience. In a series of *un*instructed ground-crew personnel air entry was visibly positive in only 83%, while in a series of experienced air-crew personnel movement of the tympanic membrane could be seen in 97.5%. These three percentages demonstrate not only the frequency of the positive visual findings but also the value of instruction in Valsalva's manœuvre. The importance of instruction has been emphasized by Fl. Lieut. Matthews, and the study of a considerable series of patients leaves no doubt that, excluding acute upper respiratory infections, ignorance of the correct methods of auto-inflation is the most frequent contributory factor in the causation of acute otitic barotrauma.—I am, etc.

J. E. G. MCGIBBON.

Medical Reciprocity

SIR,—The letters of Dr. James Burnet (Jan. 6) and of Dr. S. Chaplin (Jan. 20) on the subject of medical reciprocity seem to beg the questions of supply and demand, among others. Dr. Chaplin questions the desirability of "*permitting* [*sic*] such a state between this country and foreigners," in view of the non-acceptance of English (does he mean British?) qualifications in certain parts of the British Empire or in certain Dominions.

It takes at least two to make a bargain, and it may fairly be asked if (to take a specific case) France would be likely to acclaim the project of medical reciprocity with this country which would, the respective climates being what they are, almost certainly involve the flooding of the French Riviera with qualified refugees (the word is meant literally) from the less equable parts of these mist-wreathed islands. France wisely protected her native practitioners by decreeing that seasonal practices by foreigners (i.e., non-French) were not allowable. This inhibition will certainly be reintroduced, or continued, by the Government of the "Fourth Republic." The foreigner who wishes to practise medicine in France to-day must have a French qualification, and examinations are conducted in the French language. It is, as stated, a matter for the Privy Council at this end. In any case, as the Prime Minister has said in another connexion, there would be no harm in trying—but . . .—I am, etc.,

London, W.1. W. NUNAN.

R.M.B.F. Christmas Gifts

SIR,—It was with the utmost gratification that the late Sir Thomas Barlow received the news that his last "Christmas Gifts Appeal," made when he was in his 100th year, had once again eclipsed all previous records, and had reached the splendid total of £1,817. Had his life been spared Sir Thomas would be personally sending this letter of his most grateful thanks to the medical press, and thereby to the large number of subscribers up and down the country who, by their generosity, have contrived that each year the sum reached has beaten the previous year's record. In particular, the gracious donation of one hundred guineas by the Royal College of Physicians to memorize his entry into his 100th year and to mark the esteem in which his colleagues held him touched Sir Thomas very much and gave him keen pleasure.

On behalf of my committee I tender to one and all our sincerest thanks. We shall continue this annual "Christmas Gifts Appeal" as heretofore. They have been so generously supported and have evoked so much pleasure and gratitude that, although they will lack the inspiration of Sir Thomas Barlow's personality, we feel they have now become an integral part of our work. We are confident that this will be in accordance with the general wish.—I am, etc.,

ARNOLD LAWSON,
Chairman of the Committee of Management.
Royal Medical Benevolent Fund,
London, S.W.15.

Obituary

HAROLD COLLINSON, C.B., C.M.G., D.S.O., M.S., F.R.C.S.

We regret to announce that Mr. Harold Collinson, the eminent Leeds surgeon who held professorships of surgery there for nine years, died on Jan. 25 at Linton, Wetherby, after an illness of two or three months.

Born on Aug. 19, 1876, son of J. W. Collinson of Halifax, he was educated at the great Quaker schools at Ackworth and Bootham, and then studied at the Yorkshire College and the Leeds Medical School. A brilliant academic career culminated in Fellowship of the Royal College of Surgeons within four years of qualification, and the degree of M.S.Lond. in 1907. His first resident post in the General Infirmary at Leeds was that of house-surgeon; later he was for three years resident surgical officer and in 1907 he was elected honorary assistant surgeon, promotion to the full staff coming at the end of the last war. He had held a commission in the R.A.M.C.(T.F.) since 1905 and was mobilized with his unit, the 2nd West Riding Field Ambulance, on Aug. 4, 1914. His distinguished services in France from April, 1915, until the end of the war were recognized by the award of the D.S.O. in 1917, the C.M.G. in 1918, the C.B. in 1919; and he received from the President of the French Republic the honour of Chevalier of the Legion of Honour and the Médaille de la Reconnaissance Française. He rose to the rank of colonel, A.M.S., and was awarded the Territorial Decoration. During the present war he served as group officer, E.M.S., and regional adviser in surgery.

On the academic side at Leeds University Harold Collinson was in turn clinical lecturer in the Faculty of Medicine, professor of clinical surgery (1927–33), professor of surgery (1933–6), and finally dean for five years. Besides his valuable work at the General Infirmary he was also consulting surgeon to St. James's Hospital, Leeds, the Mirfield Memorial Hospital, the Clayton Hospital, the Wakefield and Skipton and District Hospital, and to the West Riding Mental Hospital, Wakefield. He represented the University of Leeds on the General Medical Council from 1936 to 1942. He was a Fellow of the Association of Surgeons of Great Britain and Ireland and a past president of the Leeds and West Riding Medico-Chirurgical Society. He joined the B.M.A. in 1907, was chairman of the Leeds Division in 1935–6, and served on the English and Welsh Consultants and Specialists Group Committee for three years. His published writings were almost wholly on abdominal surgery.

Of the man himself we may quote from an appreciation by "M. J. S." published in the *University of Leeds Medical Magazine* of October, 1941: "Harold Collinson's five-year tenure of the office of dean of the Faculty of Medicine terminated in September last. It was indeed a fortunate coincidence that Prof. Jamieson's departure to Trinity College, Dublin, in 1936 should coincide with Prof. Collinson's retirement from the chair of surgery. Here, immediately available, was the ideal man to be dean, a man infinitely younger than his 60 years, who enjoyed the confidence and respect of all, and who had built up an enviable reputation for straight dealing, integrity, and honesty of purpose. . . . His connexion with our School covers nearly half a century, and his record throughout, as surgeon and teacher, soldier and administrator, has been one of brilliant achievement, unspoilt by any slightest suggestion of self-seeking or hint of the Superior Person. It is not to be wondered at that this kind, generous, and courageous man has made for himself a unique place in the regard and affection of his colleagues and of many generations of students."

JAMES LIVINGSTONE LOUDON, M.D.

We regret to announce the death, in his 80th year, of this well-known Scottish member of the B.M.A. He was educated at the University of Glasgow, of which he was M.D. He was Fellow of the Royal Faculty of Physicians and Surgeons of Glasgow and a D.P.H. Among other medical appointments he had been medical officer of health of the Burgh of Hamilton. Dr. Loudon's interests were widely spread. He was an elder of the kirk, was a Justice of the Peace, a lieut.-colonel, R.A.M.C.(T.F.), with war service in France, and held the T.D. He was a well-read man with a gift for the apt quotation and a strong preference for accuracy in quotation. It was a source of pride to him that he was named after David Livingstone, the explorer, who was a great friend of his father's (also a doctor in Hamilton). Loudon had an interesting collection of mementoes and relics of his namesake. He joined the B.M.A. in 1902, and from then onwards took a very active part in its work. He was for many years secretary and chairman of the Lanarkshire Division and represented it on the Representative Body on several occasions, the last time being at Belfast in 1937. He was a member of the Central Council of the Association in 1912–18, again in 1927–9, and in 1931–6. He was a member of the Scottish Committee from 1927 to 1936, and a past-president of the Glasgow and South-Western Branch.

Dr. Loudon was a welcome figure in B.M.A. circles. Though not a frequent speaker, when he did speak it was obvious that he had something to say. He was conspicuous for his generosity, for his loyalty as a friend, and for the soundness of his judgment, and he will be greatly missed. His eldest daughter is a member of the medical profession and married the M.O.H. for Lanarkshire, Dr. J. M. Lang.

A. T. WILKINSON, M.D., F.R.C.P.

Arthur Thomas Wilkinson, who died at Poynton, Cheshire, on Jan. 21, was born in 1853, received his scientific education in the Owens College, Manchester, and had a much wider general foundation in it than was usual even then. He graduated B.A.Lond. in 1872, and B.Sc. two years later. In his medical education he had an exceptionally brilliant career, being one of those who can acquire knowledge and display it for examination requirements. In the preliminary scientific examination for the London M.B. he was awarded honours in chemistry, zoology, and botany, and in the First M.B. next year won the exhibition and gold medal in organic chemistry, materia medica, and pharmaceutical chemistry, and was third in honours in physiology (1875). He then took in his stride, so to speak, the L.S.A. diploma in 1876 and the M.R.C.S. next year. Having won honours in medicine and obstetrics in his Final M.B. he proceeded M.D. in 1880.

Before qualification Dr. Wilkinson had been physician-assistant at the Manchester Royal Infirmary, one of the last to hold this post, and subsequently was house-physician at the Infirmary and at Ancoats Hospital. General practice followed, and for many years he was one of the anaesthetists at the Royal Infirmary. While acting in this capacity one of his eyes became infected with some septic matter, causing the loss of it and the need for an artificial eye. In 1880 he was appointed assistant medical officer to the hospital, where he worked daily with the honorary staff in the out-patient department and took regular part in the elementary teaching of clinical medicine. With such a fine academical career it might be expected that he would be a good teacher, and though such promise is not always fulfilled it was in his case, and he became a popular and much-sought-after coach for the preliminary and qualifying examinations. His general-practice experience provided many useful hints on how to manage illnesses. One prescription of his had a curiously wide European reputation, for when some Manchester medical workers, including women, were assisting the Russian Army on the fatal Tannenberg front in the last war they found that scabies was treated with what the Russians called Wilkinson's ointment, the formula of which was equal parts of sulphur and ammoniated mercury ointments and of benzoated lard, the last having some special virtue additional to the other two.

He was appointed an honorary assistant physician to the Royal Infirmary in 1892, and remained in active work until his retirement on attaining the age of 60 in 1913. For many years of that time he filled the office of dean of clinical instruction, and his knowledge of the requirements of examining bodies enabled him to give useful advice to students. He lectured in the University on diseases of the kidney, and published some papers on the subject. He took a prominent part in the scientific life of the town, and was president of the medical, pathological, and clinical societies, the last-

mentioned one being very popular for many years, until the clinical meetings of the Manchester Medical Society supplied the need for it. Dr. Wilkinson was elected a Fellow of the Royal College of Physicians of London in 1907, having taken the M.R.C.P. in 1888. At the Annual Meeting of the B.M.A. in 1902 he served as secretary of the Section of Medicine. He was a member of the Wesleyan religious body, in which his father had been a well-known minister, and he gave much time and thought to its administration and educational work. For many years he lectured regularly on divinity to students in the College, and was a frequent and welcome occupant of the pulpits of chapels in the district. He had been one of the leading members of a College Social Welfare Society in his student days and earlier years of general practice.

SIR HERBERT SMALLEY, M.D.

Formerly H.M. Commissioner of Prisons

Sir Herbert Smalley died at Hove on Jan. 25. He was the third son of the Rev. Cornwall Smalley, and was born in London on June 3, 1851, and was therefore one of the oldest members of the profession. Educated at St. Paul's School and King's College Hospital he qualified M.R.C.S., L.R.C.P. in 1875, and took the M.D. degree of Durham University in 1891. He was also an Associate of King's College. He joined the Prison Service in March, 1876, and was stationed at Chatham Prison, and served later at Millbank, Dartmoor, Pentonville, Dover, and Parkhurst Prisons. In 1897 he was appointed Medical Inspector of Prisons, and in 1913 was further promoted to the office of H.M. Commissioner of Prisons and a Director of Convict Prisons. His valuable services to the State were recognized when he was knighted in 1913. He retired in 1917. He had been a member of the B.M.A. for 68 years at the time of his death.

It is almost inevitable that a man who reaches his tenth decade will leave at his death no witness to record at first hand his earlier work and ambitions. The fact that Smalley passed the primary examination for the Fellowship of the Royal College of Surgeons and the written testimony of John Curnow, the dean of his medical school, show that he was an able and earnest student. The writer of this note served under Smalley from 1899 until his retirement in 1917, and later, as Commissioner, had special opportunities of estimating the constructive value of Smalley's official work.

It was particularly fortunate that Smalley entered upon his duties as Medical Inspector of Prisons with 20 years' experience behind him as a prison medical officer. In no other way could he have appreciated so fully the peculiar problems which arise in the daily work of a prison medical officer, and no other training could have made him so wise a counsellor in the management of difficult prisoners of either sex. As soon as he became inspector Smalley set to work quietly, unobtrusively, and determinedly to establish the status of the prison medical officers on a firm basis, and, while justly balancing the disciplinary and medical issues arising in the treatment of offenders, advanced the scientific approach to criminal problems. Under his wise guidance the conditions in the prison hospitals were brought into line as far as circumstances permitted with those outside, and he encouraged the medical officers to regard the criminal as a fitting subject for individual study. He prepared the tabulated forms which were used by Goring and other prison medical officers in the anthropometrical survey which Goring analysed in his well-known publication, on *The English Convict*.

As a prison medical officer Smalley had been impressed by the necessity for a special nursing service in prisons, and one of his first cares as inspector was to establish a separate hospital male and female staff. To further his purpose he wrote an excellent *Manual of Prison Hospital Nursing* in 1902. The book was an immediate success and was used far beyond the English Prison Service. Although chiefly interested in general medicine, Smalley was ever mindful of the mental aspects of offenders, and was an authoritative witness before the Royal Commission on the Care and Control of the Feeble-Minded in 1904. His statements in the annual reports of the Prison Commissioners were marked by progressive caution, sound judgment, and a humane and human outlook upon the different problems with which he dealt. His conscientious work, common sense, wise counsel, and sustained determination to conduct the administrative as well as the medical business of the department at a high level of efficiency and humanity were recognized and highly appreciated by his fellow commissioners.

Smalley avoided publicity, but he made the public service his life's work and was content quietly to lay sure foundations upon which those who followed him could build. Those who worked with him, particularly those who succeeded him at the Home Office, know the extent of his very real success. His interest in the prison service continued up to the last. The manner in which he endeared himself to the medical officers was shown by the visits they paid him from time to time in spite of the long passage of years. Indeed, to some of us these visits were a happy pilgrimage. He married in 1885 Rose Christina, daughter of the late G. F. Grammann. There were no children, but perhaps it is not too much to believe that their affection and solicitude one for another contributed to their longevity as well as to their mutual happiness.

W. N. E.

T. HARRISON BUTLER, D.M., F.R.C.S.

Mr. T. Harrison Butler, well known as an ophthalmic surgeon far beyond the Midlands, where he practised for many years, died suddenly at Hampton-in-Arden, Warwickshire, on Jan. 29. He was a past-president of the Ophthalmological Society of the United Kingdom, and gave the Doyne Memorial Lecture (1924), the Montgomery Lectures in Dublin (1926), and the Middlemore Lecture on three occasions.

Thomas Harrison Butler, son of the Rev. G. W. Butler, was born at Stanhope, Co. Durham, on March 18, 1871. From St. Paul's School he entered Corpus Christi College, Oxford, with a scholarship in 1889, and after graduating B.A. with first-class honours in natural science in 1893, went to St. Bartholomew's Hospital. He took his medical degrees at Oxford in 1895, proceeded M.A. and D.M. in 1902, and was elected F.R.C.S. in 1941. He served as house-surgeon at Bart's and house-physician at the Royal Free Hospital, was awarded the Radcliffe Travelling Fellowship of the University of Oxford in 1896, and attended eye clinics at Kiel, Berlin, Dresden, Vienna, and Zurich. For four years he worked as assistant surgeon to the British Ophthalmic Hospital in Jerusalem, and then as plague medical officer at Capetown. On returning to this country he was elected ophthalmic surgeon to the Coventry and Warwickshire Hospital in 1909, to the Warneford Hospital, Leamington, in 1910, and three years later joined the visiting staff of the Birmingham and Midland Eye Hospital; in 1918 he became consulting ophthalmic surgeon to the Hospital of St. Cross, Rugby, and afterwards honorary ophthalmic surgeon to the West Bromwich and District General Hospital. He was a prominent member of the Midland Ophthalmological Society, and active in the work of the Oxford Ophthalmological Congress from the time of its foundation.

The earliest papers by Harrison Butler were on refraction, on ophthalmology in Palestine, on tuberculous disease of the uvea, and on the treatment of trichiasis, and he wrote much else on the surgery of the eye, but his name is best known to the profession as an authority on slit-lamp ophthalmoscopy. His valuable and most complete *Illustrated Guide to the Slit-Lamp* appeared in 1927; it was a fine piece of work on the use of that instrument in eye disease, to the making of which there had gone much careful observation and accurate recording. The book was founded upon a series of lectures at the University of Oxford, together with the Doyne Memorial Lecture and the Montgomery Lectures. It is believed that the whole of the 158 illustrations in the text and the 21 additional figures in the five coloured plates were the work of his own skilled hand as a draughtsman.

Harrison Butler joined the B.M.A. in 1897, was vice-president of the Section of Ophthalmology at the Annual Meeting of 1926, and did good work on a number of special subcommittees at headquarters, where his membership of the Ophthalmic Group Committee ran continuously from 1923. Outside his profession he was an ardent yachtsman, a member of the Royal Cruising Club, and the author of several contributions to yachting journals. As an undergraduate he had rowed in the Corpus VIII, and in later life he became president of the Little Ship Club.

CECIL JOLL, M.CH., F.R.C.S.

Dr. H. W. LOFTUS DALE writes from Aylesbury:

Mr. C. A. Joll's untimely death, while a great loss to surgery as a whole, is particularly felt by his colleagues at the Royal Bucks Hospital, with which he had been associated since 1920. It would be superfluous for me to touch on his brilliance as a surgeon. Although it was one of his minor appointments, he had a great affection for the Royal Bucks and did much to raise and maintain its prestige as the county hospital. He always attended personally and with unfailing punctuality. His own matchless efficiency

inspired all those who worked with him to give of their best, with the result that we got through an amazing volume of work which was a constant source of wonder to succeeding generations of residents and theatre sisters; all fell under his spell. I acted as his anaesthetist for 21 years, and his death deprives me of a very great friend and valued colleague; his superb technique made my work for him a real pleasure. He was a mine of information on any subject and possessed a keen sense of humour. His axioms and aphorisms uttered during operations will long be remembered and with profit by all colleagues in Aylesbury, and by many generations of residents. In no circumstance of hazard or of exasperation have I seen him lose his head or his temper; he was only intolerant of inefficiency. He carried on his work here until very shortly before his death, which has deprived us of a surgeon difficult to replace. We have the memory of a loyal friend and colleague which time will not readily efface.

We regret to announce the death on Jan. 12 at his home in Dublin of Dr. JOHN AGAR MATSON, a former President of the Royal College of Physicians of Ireland and consulting physician to the Richmond and other Dublin hospitals. Dr. Matson studied at Trinity College, Dublin, graduated B.A. in 1886, M.B., B.Ch., B.A.O. in 1888, and M.D. in 1889; he also obtained a special certificate in gynaecology when taking the licence in midwifery at the Rotunda Hospital. After qualification he spent some time in England as clinical assistant to the Great Northern Central Hospital, London, and house-surgeon to the Royal Southern Hospital, Liverpool. On returning to Dublin he worked as resident at the Mater Misericordiae Hospital. Dr. Matson took the licence of the Royal College of Physicians of Ireland in 1901, the Membership in 1903, and was elected a Fellow in 1904. He served as censor in medicine, held office as Vice-President of the College in 1929, and was President in 1934; he also acted as censor in medicine for the Irish Royal College of Surgeons. He published clinical papers in the *Transactions of the Royal Academy of Medicine in Ireland* and in the *Dublin Journal of Medical Sciences*. Dr. Matson joined the British Medical Association as long ago as 1889.

We regret to record the death on Jan. 24 of DAVID LIVINGSTON HAMILTON at Cambridge. He was born on Jan. 27, 1864, and was educated at Ledwich and Carmichael College, Dublin, and Owens College, Manchester, qualifying L.R.C.P. and L.R.C.S.Ed. and L.R.F.P.S.Glas. in 1887 and L.M. Coombe Hospital in 1886. He obtained the F.R.C.S.Ed. in 1895. In 1902 he was elected honorary anaesthetist to the Southern Hospital, Manchester. Dr. Hamilton practised for many years at Great Missenden, Bucks, and later at Dover. On being evacuated from Dover in 1941 he purchased a practice at Cambridge and continued to work there until a few days before his death. He was a much-loved doctor, and his unfailing kindness caused his patients to look up to him not only as their physician but as their guide and friend. Though his practice was extensive he never failed to keep himself abreast of new advances. For many years he was a keen Volunteer and Territorial officer, and was promoted lieut.-col. in the R.A.M.C.(T.) in 1911. During the 1914–18 war he commanded No. 82 Field Ambulance in France and was later appointed D.A.D.M.S. to the 1st Army in England. He took a considerable interest in the St. John Ambulance Brigade and was awarded the honour of Serving Brother in 1934. He married in 1885 Miss Helen Ida Bagge, who died in 1903, and in 1922 he married Miss Gertrude Marshall, whose devoted care did much to enable him to carry on a busy practice to the advanced age of 80. His family consisted of three sons, all of whom are now serving in the Forces, and two daughters.

The Services

Lieut.-Gen. Sir James A. Hartigan, K.C.B., C.M.G., D.S.O., has been appointed Colonel Commandant of the R.A.M.C. for 1945, and Major-Gen. J. P. Helliwell, C.B.E., M.R.C.S., Colonel Commandant of the Army Dental Corps for 1945.

The name of Fl. Lieut. R. V. Robinson, R.A.F.V.R., was omitted from the list of Air Force medical officers mentioned in dispatches (*Journal*, Jan. 20, p. 98).

CASUALTIES IN THE MEDICAL SERVICES

Died from injuries.—Lieut.-Col. Martin Patrick Conroy, I.M.S.

Prisoner of war.—Capt. J. W. Logan, D.S.O., R.A.M.C.

Universities and Colleges

UNIVERSITY OF CAMBRIDGE

At a Congregation held on Jan. 26 the following medical degrees were conferred:

M.B., B.CHIR.—*J. D. Andrew, E. L. Arnold, D. V. Bates, *T. C. Beard, W. M. Bennett, J. H. E. Bergin, I. J. Carré, W. R. Cole, *C. H. de Boer, E. D. Dyson, T. P. S. Frew, S. A. M. Garibian, H. McC. Giles, P. F. Haggart, F. G. J. Hayhoe, P. R. Headley, J. G. Holmes, D. G. James, E. G. Jenner, E. D. Jones, J. D. S. Knight, A. G. Leatham, P. F. Lucas, E. T. G. Meade-Waldo, J. M. Morgan, M. W. L. Mutch, E. W. Nation, W. J. Naunton, G. A. Newsholme, D. A. Pond, P. K. Robinson, G. H. Searle, K. W. Symons, *J. M. Thomas, W. E. W. Tilleke, *J. Upsdell, D. P. Wheatley, R. A. Womersley, K. A. A. Wray, M. F. T. Yealland.

B.CHIR.—R. O. Lee.

* In person.

ROYAL COLLEGE OF OBSTETRICIANS AND GYNAECOLOGISTS

At a meeting of Council held on Jan. 27, with the President, Mr Eardley Holland, in the chair, the following candidates were elected to the Membership:

Amelia E. Burch, J. P. O. Erskine, E. Garland-Collins, A. B. Hay, J. Karnicki, Gladys E. Keith, Dorothea M. Kerslake, Sybil G. Mocatta, Dorothy M. Shotton, B. G. G. Spiers, Dorothy J. Thompson.

ROYAL COLLEGE OF PHYSICIANS OF LONDON

At a quarterly comitia of the Royal College of Physicians of London held on Jan. 25, with the President, Lord Moran, in the chair, it was announced that a committee was being set up to consider the problems arising out of demobilization. A memorandum was received on the future organization of the psychiatric services.

The following candidates, having satisfied the Censors' Board, were elected Members of the College:

J. F. Ackroyd, M.B.Brist.; *G. M. Barrett, M.B.Camb., Lieut., R.A.M.C.; *M. P. Bhagat, M.D.Bombay; Georgiana M. Bonser, M.D.Manch.; R. J. Cairns, M.B.Lond.; *P. L. C. Carrier, M.D.Lond., Lieut.-Col., R.A.M.C.; *L. B. Carruthers, M.D.Kingston, Ontario; *P. K. Chattopadhyay, M.B.Calcutta; *N. S. Clark, M.B.Aberd., Major, R.A.M.C.; *A. M. Dawes, M.B.Lond., Capt., R.A.M.C.; D. P. Degenhardt, M.B.Ed.; C. E. Dent, M.B.Lond.; M. A. Floyer, M.B.Camb.; *R. H. Girdwood, M.B.Ed., Capt., R.A.M.C.; T. A. Grimson, M.B.Lond.; R. H. R. Hartley, L.R.C.P.; C. F. Hawkins, M.B.Lond.; T. C. Highton, M.B.Liverp., Temp. Surg. Lieut., R.N.V.R.; *J. C. Houston, M.B.Lond., Capt., R.A.M.C.; E. A. Hunter, M.B.Lond.; M. R. Jeffrey, M.B.Camb.; A. T. Jones, M.D.Liverp.; *M. R. Joseph, Major, R.A.M.C.; *A. C. Kendall, M.B.Birm., Capt., R.A.M.C.; *H. S. Khandheria, M.B.Bombay; H. Levy, M.D.Berne; G. M. Little, M.B.Camb.; S. Locket, L.R.C.P.; *D. Macaulay, M.B.Glas., Capt., I.A.M.C.; *J. G. McGill, M.D.Belf., Capt., R.A.M.C.; W. A. Maclure, M.B.Glas., Surg. Lieut., R.N.V.R.; W. Mayer-Gross, M.D.Heidelberg; *J. K. Mehta, M.D.Bombay; *A. B. Mukerjee, M.B.Calcutta; J. M. Naish, M.B.Camb., Surg. Lieut., R.N.V.R.; *M. J. Parsonage, M.B.Manch., Capt., R.A.M.C.; *S. Renfrew, M.B.Glas., Capt., R.A.M.C.; *J. L. Reynolds, M.B.New Zeal., Capt., R.A.M.C.; *E. N. Rowlands, M.D.Manch., Major, R.A.M.C.; R. D. W. Schofield, M.B.Lond.; *S. M. Shah, M.B.Bombay; E. G. Sita, M.B.Camb., Surg. Lieut., R.N.V.R.; J. Sondheimer, M.B.Lond.; *R. Subramaniam, M.D.Madras; G. I. M. Swyer, B.M.Oxon.; Margaret D. Thompson, M.B.Birm.; R. D. Tonkin, M.B.Lond., Fl. Lieut., R.A.F.; *W. D. Wallace, M.B.Sheffield, Capt., R.A.M.C.; *M. Ware, M.B.Lond., Capt., R.A.M.C.; B. G. Wells, M.B.Lond.; J. R. F. Williams, M.B.Lond.; *A. W. Woodruff, M.D.Durham, Squad. Ldr., R.A.F.

* *In absentia.*

Licences to practise were granted to the following 125 candidates (including 19 women) who had passed the Final Examinations in Medicine, Surgery, and Midwifery of the Conjoint Board, and have complied with the necessary by-laws:

Hildegard C. Abraham, R. A. Allen, Alison H. C. Alwyn-Smith, R. Andrew, E. A. Balls, W. A. D. Barwise, M. A. Bernays, A. E. Bernstein, K. A. Bhagan, F. J. A. H. Blackwood, R. A. Boland, Daphne V. Bousfield, R. G. L. Brittain, B. H. Brock, A. S. V. Burgen, J. S. Campbell, R. J. F. Campbell, A. A. Cohen, D. H. P. Cope, H. J. P. Davies, Margaret E. Davies, R. De Vere, D. Dooley, E. J. Dowling, J. M. Drew, M. W. Eddings, K. A. Elliott, T. Ellis, Edith M. Evans, T. A. Evershed, R. C. Farrow, Ruth M. Fawcett, N. R. Fenton, W. N. Fitzpatrick, M. W. Fordham, W. P. Foster, A. T. H. Glanvill, F. J. Goodey, M. V. Guilmant, K. J. Gurling, J. Harding Cox, Mary L. Hare, J. E. Holgate, J. G. Holmes, E. H. Hopkinson, Dorothy I. Howes, Mary P. Hughes, M. F. Hunt, Flavia Z. L. B. James, R. M. Jenner, Moyra P. C. Johnsen, E. D. Jones, S. Jones, I. M. Kahan, A. P. Kalra, W. de M. Kellock, D. R. Laurence, S. Levine, D. O. Lloyd, H. R. Lomax, Margaret D. T. Lord, G. E. Luke, R. P. C. MacDonald, Kathleen M. M. McDougall, J. R. Macintyre, C. B. McKerrow, D. MacKinnon, Nora S. McRaith, H. B. Marsden, J. D. Martin, S. Mason, G. Mizbah, M. G. Moore, A. V. Morse, E. W. Nation, G. F. Newbold, D. R. L. Newton, D. P. Nicholson, T. M. Nott-Bower, P. R. Ormrod, G. P. Oxborrow, G. Pollitt, Jean P. Popple, R. W. Povey, T. H. Powell, I. H. Pratt, J. M. Reed, A. P. Roberts, J. M. Roberts, J. H. Robinson, G. J. Romanes, G. A. Rundle, E. L. N. S. Sack, R. G. H. Salkeld, A. O. Sankey, H. Schwartz, M. G. Scott, Elizabeth M. Sefton, J. Sharp, A. F. Sheldon, D. W. S. Sheldon, C. B. Sherer, J. P. Shillingford, S. Shubsachs, D. B. Spanton, J. Stafford, G. W. Storey, H. D. Symon, S. D. Tejani, A. E. Thomas, Betty Thomas, J. L. Thomas, N. A. Thorne, C. Todd, G. Twynholm-Mason, Vivian M. N. Usborne, P. H. Vernon, P. Watson, P. Weinstein, D. P. Wheatley, P. J. Wilkinson, Olwen D. Williams, D. H. Woodhead, M. F. T. Yealland, G. Yerbury.

Diplomas in Child Health and in Anaesthetics were granted jointly with the Royal College of Surgeons of England to the candidates whose names were published in the report of the meeting of the Royal College of Surgeons of England in the *Journal* of Dec. 30, 1944 (p. 871) and Diplomas in Public Health, in Psychological

Medicine, and in Laryngology and Otology were granted jointly with the Royal College of Surgeons of England to the candidates whose names were published in the report of the meeting of the Royal College of Surgeons of England in the *Journal* of Jan. 27 (p. 135).

CONJOINT BOARD IN SCOTLAND

The following candidates, having passed the requisite examinations, have been admitted L.R.C.P.Ed., L.R.C.S.Ed., L.R.F.P.&S.Glas.:

W. C. Adam, J. H. Beckford, M. G. Blackwood, G. W. Blueglass, W. J. Connelly, A. W. Craig, B. Cutler, A. A. Donaldson, L. P. Eaton, J. Fegan, T. M. Glaister, S. M. Harris, Cacilia M. Hofer, Jean Hughes, J. D. Jack, S. Jesner, Helen T. Kilpatrick, S. J. MacKinnon, A. McKirdy, W. D. MacLennan, A. B. Marshall, A. L. Nowell, D. Peebles, D. R. L. Peill, F. C. Place, W. Roberts, J. Rubin, D. G. Scott, A. A. El Serougi, B. M. Steen.

SOCIETY OF APOTHECARIES OF LONDON

Mr. Eardley Holland, President of the Royal College of Obstetricians and Gynaecologists, will deliver a lecture on "The New Obstetrics and Gynaecology" at Apothecaries' Hall, Black Friars Lane, Queen Victoria Street, E.C., on Tuesday, Feb. 20, at 2.30 p.m. Members of the medical profession and senior students are invited to attend.

Medical Notes in Parliament

Relief for Channel Islands

In the House of Lords on Jan. 30 the EARL OF MUNSTER, replying to Lord Portsea, said that the Government was doing everything it could to supplement the basic rations of the civil population in the Channel Islands. Representatives of the International Red Cross, who had visited the islands, stated that the unloading and disposal of the supplies taken in her first voyage by the *Vega* had proceeded satisfactorily, and he took it that the supplies were now in the hands of the civil population. The *Vega* was damaged in harbour in Guernsey, and repairs had become necessary, but she would sail on her second trip on Feb. 1. When she sailed again she would carry as many as possible of the articles which were recommended by the Red Cross representative. The stores she would carry would include soap and salt, medical supplies and drugs, and more food parcels, and would do a great deal to alleviate the position. The question of evacuating seriously ill persons who could not receive proper medical attention in the islands was discussed by the Red Cross representatives, and the matter was being actively pursued by the Government.

Medical Care of Returned P.O.W.

On Jan. 30 Sir ERNEST GRAHAM-LITTLE asked the Minister of Health whether he would inquire into the medical accommodation supplied to prisoners of war on their return to this country with a view to its improvement; and if he was aware that the conditions provided for prisoners with tuberculosis were such as to disturb Service welfare workers. Mr. WILLINK: Returning prisoners of war have the benefit of all the resources of the Emergency Hospital Scheme, where the Service Department concerned requests that they be treated under that scheme. As regards those suffering from tuberculosis whose condition calls for sanatorium treatment, special measures are taken to secure their admission to a sanatorium, but in the present difficulties of limited accommodation it is not always possible to avoid a short waiting period at home, during which the patient is under the expert care of the tuberculosis officer. If Sir Ernest Graham-Little has in mind any particular case for which he considers that inadequate provision has been made I shall be glad to make inquiries.

Women Doctors in Government Departments

On Jan. 23 Capt. PRESCOTT asked the Chancellor of the Exchequer whether there was a general ban on the employment in Government Departments of married women doctors; and whether, in view of their special qualifications, especially for employment in the Ministry of Health, he would consider action to secure their employment in suitable cases. Sir JOHN ANDERSON: The normal rule is that married women are ineligible for appointment to established posts in the Civil Service, and that women holding such posts should be required to resign on marriage; but an exception may be made, upon application by the woman concerned, in any case where it is considered that the employment of a married woman is advisable in the light of her special qualifications, or special experience in relation to the duties required of her, or of the special requirements of the Department concerned. In view of the power to make exceptions in such cases, no special action seems to be needed in relation to women doctors.

Capt. PRESCOTT: In view of the shortage of doctors at the present time—a shortage which is likely to continue in the future—and of the special adaptability of women doctors for certain branches of the Service, ought not the general ban to be lifted? Sir JOHN ANDERSON: The case of doctors is certainly very special, and, as I have just explained, the general rule can be relaxed. I know of no case in which permission has been refused to a woman doctor. Capt. PRESCOTT asked why the ban should be retained, and if it was not redundant, but Sir JOHN ANDERSON replied that that was a matter of debate.

Nurses Bill

In the House of Lords on Jan. 23 the EARL OF LISTOWEL moved the second reading of the Nurses Bill, the object of which is to correct a drafting error in the Nurses Act and the Nurses (Scotland) Act. He explained that these Acts were intended to protect private patients or hospital authorities from unfair treatment—such as demands for excessive fees or the ministrations of unqualified nurses—on the part of nursing agencies to which they applied for assistance in cases of illness. Certain conditions to which these agencies, or nurses' co-operations, had to conform were laid down in the two Acts, in order to prevent these abuses, but the expression "agency for the supply of nurses" was so drafted that it might be taken to cover innocuous organizations like county and district nursing associations. The only way to safeguard these associations and the district nurses, as well as to apply the necessary control to the nurses' co-operations, was to narrow down the meaning of "agency for the supply of nurses" and exclude from the regulations those excellent bodies with which no one had ever desired to interfere. This the Bill did. The Bill was read a second time.

Sale of T.T. Cattle.—Mr. TOM WILLIAMS on Jan. 25 told Gen. Clifton Brown that cows which had passed a tuberculin test were being sold at markets as such, though they had not come from tuberculin-tested herds. The only markets subject to official regulation as to the classes of cattle that might be sold were those authorized under the Tuberculosis (Attested Herds) Scheme. At such markets the only cattle that could now be sold were cattle from herds within this scheme, and cattle from herds licensed for the production of tuberculin-tested milk.

Notes in Brief

In 1943, 5,796 people were killed on the roads and 116,740 were injured. In the first 11 months of 1944 the corresponding figures were 5,807 and 112,833.

A scheme is under consideration for the control of malaria in Mauritius involving capital expenditure estimated to amount to £1,500,000. Antimalarial work is being carried out in the island.

Medical News

Sir John Boyd Orr, M.D., F.R.S., has resigned the post of director of the Rowett Research Institute, Bucksburn, Aberdeenshire, and the vacancy will be advertised at an early date. The post carries with it the directorship of the Imperial Bureau of Nutrition and the editorship of *Nutrition Abstracts and Reviews*.

At the next meeting of the Royal Society of Tropical Medicine and Hygiene, to be held at 26, Portland Place, W., on Thursday, Feb. 15, at 3 p.m., Prof. P. A. Buxton, F.R.S., will read a paper on the use of the new insecticide D.D.T. in relation to the problem of tropical medicine.

A meeting of the Middlesex County Medical Society will be held at Staines County Hospital on Thursday, Feb. 22, at 3 p.m., when papers will be read by Dr. A. Barham-Carter on "The Treatment of Some Hysterical Manifestations," and Mr. N. M. Matheson on "The Diagnosis of Urinary Tuberculosis." A discussion will follow.

The Chadwick Trust has arranged the following lectures: Tuesday, Feb. 20, 2.30 p.m., at Royal Society of Tropical Medicine and Hygiene, 26, Portland Place, W., Dr. J. D. Rolleston, "The War and Infectious Disease." Tuesday, March 13, 2.30 p.m., at London School of Hygiene and Tropical Medicine, Keppel Street, W.C., Dr. Albert Parker, "Atmospheric Pollution." Tuesday, April 10, 2.30 p.m., at Royal Sanitary Institute, 90, Buckingham Palace Road, S.W., Mr. A. Trystan Edwards, "Sunlight and Sanitation in Relation to the Planning of Buildings." Tuesday, May 8, 2.30 p.m., Royal Society of Tropical Medicine and Hygiene, Mr. Eardley Holland, "On the Importance of a Maternity Service in the Life of the Nation." Thursday, June 14, 4 p.m., at Chelsea Physic Garden, Swan Walk, S.W., Mr. C. J. Layton, "Health and Horticulture." Admission to all the lectures is free and tickets are not required.

Dr. Simon Wigoder has been elected alderman and returning officer for the North Ward of the Borough of Morley.

The Royal Sanitary Institute announces the following sessional meetings: Feb. 24, at 10.30 a.m., at Radiant House, Bold Street, Liverpool; papers on "Public Health and the Social Services," by Dr. C. O. Stallybrass, and "Post-war Housing," by Mr. L. H. Keay. March 10, at 10.30 a.m., at Westover Senior School, Wembdon Road, Bridgwater; papers on "Water Supply Problems in Rural Districts," by Sir William Savage and Mr. A. J. Allen. March 14, at 2.30 p.m., at Royal Sanitary Institute, 90, Buckingham Palace Road, S.W.; paper on "Insect Pests in Food," by Mr. V. Wadsworth. March 17, at 10.30 a.m., at Norwich Guildhall; papers on "Rat Destruction Work in Norwich," by Mr. G. D. Kirby, and "Food Poisoning," by Dr. A. J. Macdonald. The Cheshunt sessional meeting arranged for March 2, announced in the *Journal* of Jan. 13 (p. 65), has been cancelled.

Dr. Norman Macfadyen, chairman of the Executive Committee of the Town and Country Planning Association from 1929 to 1944, was recently presented at the headquarters in London with the Howard Memorial Medal.

The Sir Robert Jones Gold Medal for 1944 has been awarded by the British Orthopaedic Association to Mr. F. G. St. Clair Strange, F.R.C.S., for his essay on "The Major Amputation Stump in Health and Disease," read at a recent meeting of the association.

The Minister of Fuel and Power has appointed Prof. J. M. Mackintosh, M.D., a member of the Fuel and Power Advisory Council.

EPIDEMIOLOGICAL NOTES

Discussion of Table

In *England and Wales* infectious diseases increased in prevalence, the rises over last week's totals being: measles 1,075, scarlet fever 234, whooping-cough 107, dysentery 75, diphtheria 59, cerebrospinal fever 24.

The rise in diphtheria was due to a serious local outbreak in Caernarvonshire, Bangor M.B., where 55 cases, a little more than one-tenth of the total of the whole country, were reported. There was a small increase in scarlet fever notifications in most areas; Lancashire reported 77 more cases than last week, and Yorks West Riding 32. The rise in whooping-cough was greatest in Wales, where notifications exceeded last week's total by 43. Increases in measles were as follows: Yorks West Riding 254, Derbyshire 147, Nottinghamshire 145, Staffordshire 129, Middlesex 109, Essex 98, Lancashire 94, London 80. In Warwickshire notifications dropped by 146, and in Durham by 52. Eight of the 11 cases of typhoid were reported from Lancashire (Manchester C.B. 6, Liverpool C.B. 1, Warrington R.D. 1). The total for cerebrospinal fever was the largest for nine months; the cases were widely spread throughout the country, involving twenty-eight counties, although half the cases were reported from four counties: Lancashire 14, Yorks West Riding 10, Warwickshire 8, Durham 7.

Ninety-two cases of dysentery were notified in Yorks West Riding—8 fewer than last week; the chief centres of infection were Wakefield C.B. 64, and Sheffield C.B. 18. In Buckinghamshire, Aylesbury R.D., the notifications rose from 14 to 62. The other large returns were London 45, Gloucestershire 20, Essex 19, Lancashire 18, Middlesex 10, Suffolk 10.

Almost 100 civilians who have been in contact with the smallpox case at an Army camp in Anglesey have been traced. These are being kept under observation in the absence of isolation facilities. Only a few persons have taken advantage of the free vaccination offer.

In *Scotland* scarlet fever notifications were 33 higher than last week, and those for acute primary pneumonia 25; there were 313 fewer cases of measles, 95 fewer of whooping-cough, and 21 fewer of diphtheria. Although dysentery notifications fell by 7 cases for the whole country, the western area showed an increase of 10, the chief returns being Glasgow 22, Falkirk 11, and Clackmannan County 9.

In *Eire* diphtheria notifications dropped by 16 cases to a total of 97, the lowest for recent months. Delayed returns in Waterford C.B. accounted for the apparently large rise in the incidence of dysentery.

In *Northern Ireland* measles notifications were at the lowest level since the beginning of November, 57 fewer cases being reported than last week.

Week Ending January 27

The returns of infectious diseases in England and Wales during the week included: scarlet fever 1,510, whooping-cough 1,625, diphtheria 450, measles 12,941, acute pneumonia 1,397, cerebrospinal fever 81, dysentery 295, paratyphoid 3, typhoid 3. Eighty-seven deaths were attributed to influenza in the great towns.

No. 3

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended Jan. 20.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland.

Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for: (a) The 126 great towns in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1945 (a)	(b)	(c)	(d)	(e)	1944 (Corresponding Week) (a)	(b)	(c)	(d)	(e)
Cerebrospinal fever	77	5	25	3	1	70	4	19	3	1
Deaths		1	—				—	1		
Diphtheria	518	15	133	97	15	712	33	174	110	51
Deaths	12	—	1	2	2	10	—	9	1	—
Dysentery	377	45	75	23*	—	148	41	69	1	1
Deaths				—	—				—	—
Encephalitis lethargica, acute	—	—	—	—	—	1	—	—	—	—
Deaths		—					—			
Erysipelas			54	12	3			49	15	4
Deaths		1					—			
Infective enteritis or diarrhoea under 2 years				12					10	
Deaths	50	4	7	3	2	46	7	8	16	7
Measles†	12,054	290	576	25	182	661	118	138	212	1
Deaths	16	—	1	—	—	—	—	—	7	—
Ophthalmia neonatorum	51	2	18	—	1	65	5	22	—	1
Deaths										
Paratyphoid fever	1	1	1 (B)	—	—	2	1	4	—	—
Deaths	—	—	—	—	—	—	—	—	—	—
Pneumonia, influenzal‡	1,399	77	14	8	13	1,122	141	30	21	3
Deaths (from influenza)	56	6	3	—	—	143	16	4	6	—
Pneumonia, primary			344	32				300	30	
Deaths		92		21	23		85		19	17
Polio-encephalitis, acute	1	—				1	—			
Deaths		—					—			
Poliomyelitis, acute	9	1	—	1	1	5	—	—	1	—
Deaths		—					—			
Puerperal fever		1	9		1		5	14		—
Deaths										
Puerperal pyrexia§	137	9	21	—	1	181	11	16		5
Deaths		—					—			
Relapsing fever	—	—			—	—	—			—
Deaths										
Scarlet fever	1,564	73	245	15	42	2,110	157	186	31	99
Deaths	1	—	2	—	—	1	—	—	—	—
Smallpox	—	—	—	—	—	—	—	—	—	—
Deaths				—	—				—	—
Typhoid fever	11	—	2	5	—	2	1	—	5	—
Deaths	—	—	—	—	—	—	—	—	—	—
Typhus fever	—	—	—	—	—	—	—	—	—	—
Deaths				—	—				—	—
Whooping-cough†	1,785	50	190	47	20	2,215	178	233	74	22
Deaths	12	1	1	1	—	15	—	1	2	—
Deaths (0–1 year)	494	48	59	33	27	453	59	80	69	28
Infant mortality rate (per 1,000 live births)										
Deaths (excluding still-births)	6,864	1091	738	273	171	5,841	935	698	258	167
Annual death rate (per 1,000 persons living)			16·8	17·6	¶			16·0	16·8	¶
Live births	6,778	728	802	359	264	6,515	865	888	364	252
Annual rate per 1,000 persons living			16·0	23·2	¶			18·1	23·8	¶
Stillbirths	221	16	29			252	27	31		
Rate per 1,000 total births (including stillborn)			35					34		

* Includes cases since November, 1944.

† Measles and whooping-cough are not notifiable in Scotland, and the returns are therefore an approximation only.

‡ Includes primary form for England and Wales, London (administrative county), and Northern Ireland.

§ Includes puerperal fever for England and Wales and Eire.

¶ Owing to evacuation schemes and other movements of population, birth and death rates for Northern Ireland are no longer available.

Letters, Notes, and Answers

All communications with regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, LONDON, W.C.1. TELEPHONE: EUSTON 2111. TELEGRAMS: *Aitiology Westcent, London.* ORIGINAL ARTICLES AND LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone unless the contrary be stated.

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B.M.A. SCOTTISH OFFICE: 7, Drumsheugh Gardens, Edinburgh.

ANY QUESTIONS?

Seborrhoeic Patches

Q.—*What is the best treatment for the seborrhoeic patches often seen on the temples of old people?*

A.—Several different conditions are covered by the above question. Senile keratosis, especially met with in those who have lived in the Tropics, and often pre-malignant, usually requires radiotherapy; otherwise the CO_2 pencil applied for 30 seconds may be adequate. The simpler pigment patches clear up after light freezing with CO_2, and this also applies to the true seborrhoeic warts, which are, however, more common on the trunk than on the face. Painting with pure carbolic is also recommended for this condition.

Removing Blackheads

Q.—*What is the best method of getting rid of "blackheads" on the face? Is there any way to prevent their developing?*

A.—First steam the face, or apply a hot sponge for 5 to 10 minutes; then with a special instrument *gently* remove the blackheads, leaving those alone which offer any degree of resistance. A simple extractor can be made from a piece of laboratory glass tubing, 1 in. in length, the sharp edge rounded off in the Bunsen flame. This, with salicylic acid 3 or 4% in soft paraffin, provided it is tolerated, assists by its peeling action.

Tubercle-infected Fomites

Q.—*In many sanatoria patients do leather-work, make jewellery, toys, table-mats, knitted articles, etc. Is there any definite instance of infection following the selling of such articles to people outside? Theoretically all such things are infected, whether the maker is sputum-positive or not. Should not the clothes and belongings of a patient before discharge be put through some form of terminal disinfection? Is it wise for a patient to take home any books he may have acquired during his stay in a sanatorium?*

A.—The part which inanimate objects (fomites) play in the spread of tuberculous infection is probably small but is obviously difficult to assess. The greatest risk would be to young children, who instinctively put everything they handle into the mouth; and in a household where there is a tuberculous case (often undiagnosed) spread of infection to infants by fomites almost certainly occurs, for a fair proportion of abdominal and glandular tuberculosis is due to the human type of tubercle bacillus. Tubercle bacilli exposed to daylight, directly or even through glass, have a limited viability—a few hours to a few days—so that surface contamination of leather goods and hardware with infected droplets is unlikely to be a serious hazard to those who buy these goods. Besides, the mordants used in dyeing leather are probably bactericidal, and prudent people would wash any hardware articles brought from a sanatorium. Knitted and other woollen garments are usually sterilized before release. As for clothing, the patient who is up and wearing outdoor clothes has been trained to the use of his sputum flask, and is unlikely to contaminate his suit by expectoration. Coughing in a sanatorium is a remarkably rare phenomenon, and patients cover their coughs with the handkerchief issued daily and kept in a special "pocket."

Books are perhaps the greatest danger, especially if an infective patient "wet-thumbs" the pages. However, experiments have shown that tubercle bacilli can rarely be recovered after a month from books heavily contaminated with tuberculous sputum and kept in a cupboard (see *Publ. Hlth.*, 1940, **53**, 157). Thus the patient wishing to take home books acquired while in the sanatorium may safely do so if he puts them in quarantine for 3 to 4 weeks. Dry heat is the only form of active sterilization applicable to books, but even this cannot be considered harmless. Outside "airing" would reduce the period of infectivity.

Body Temperature Readings

Q.—*There seems to be a difference of opinion about when and how to take the correct temperature of the body, and I should be glad of an expert opinion. A Kew certificate clinical thermometer starting at 96.5° in my case (I am liable to T. 99° in the evenings from tracheitis) will hardly move in 2 minutes and will take 10 minutes to reach 99° (at the same time I have symptoms compatible with a rise of temperature). A colleague says that a 30-second thermometer should rise within a minute, and if kept in place will continue to do so, also that the temperature rises above normal in the ordinary way. Are the last two true? Is the temperature taken per rectum or by placing a thermometer in the stream of urine to be considered as correct, and how does such compare with the temperature taken in the mouth?*

A.—Although thermometers are described as 1/2-minute or 1-minute, these are purely technical specifications and have little bearing on their use in practice. No clinical thermometer can be expected to come into equilibrium with the body in less than 2 minutes however it is used. Nurses are taught not to shake the mercury below 95°, to minimize delay. For accurate records the rectal temperature is preferred and the thermometer is left *in situ* for 5 minutes. In the mouth it is generally agreed that it may take up to 10 minutes for equilibrium to be obtained; nevertheless for ordinary work it is usually sufficient to read the temperature at, say, 3 minutes and then at short intervals thereafter until the difference between successive readings approaches zero. Readings in the axilla and groin are the least satisfactory, particularly in thin people. The normal range of temperature was discussed in an answer on May 29, 1943 (p. 683). For the rectum it is 97.7° to 99.5°. Mouth temperatures are 1.0° lower than rectal temperatures, and axillary temperatures are 0.5° lower than mouth temperatures. The time of the maximum temperature is usually between 5 and 8 p.m., but in cases of suspected pyrexia it may be desirable to take the temperature 4-hourly or even 2-hourly so as not to miss the peak. The temperature may exceed the normal range after exertion, though it should return to normal in 1/2 to 1 hour. Mouth temperatures are higher when there are local inflammatory lesions in the mouth, and lower when the nose is blocked and the mouth cannot be kept closed. The temperature in a stream of urine is 0.5° below the rectal. Urinary temperatures are of most value in cases of exposure, when the temperature may be too low to record with a clinical thermometer and the temperature of the urine may be recorded with a bath thermometer.

Infection of Urinary Tract

Q.—*A woman aged 55 had a deformed kidney removed many years ago. Blood urea is normal, and urine usually has many B. coli. Every few weeks she has a shivering attack and frequency, in spite of taking prophylactic courses of mandelic acid and citrate alternately. Is a vaccine of use? The remaining kidney was investigated at the time of the operation.*

A.—The efficacy of mandelic acid treatment is only detracted from by alternating periods on potassium citrate: they simply serve to give the bacteria a congenial rest from acid assault. Has an adequate course of mandelic acid been given? That is to say, one lasting 10 days and reinforced by the administration of ammonium chloride in such doses as demonstrably to reduce the *p*H of the urine to 5.0. If this fails, a course of sulphanilamide should be tried. The persistence of the infection and the history of the removal of a deformed kidney suggest that the condition may be a pyelonephritis rather than a simple infection of the urinary tract (it would be of interest to know the blood pressure); if this is so, sulphanilamide has a better chance than mandelic acid, since the latter acts only in the urinary tract itself. Opinion on the utility of an autogenous vaccine in such conditions is divided; its likelihood of success would presumably depend, at least in part, on whether deficient resistance to infection is the sole cause, or whether there is also some structural abnormality of the urinary tract predisposing to chronic infection.

Early Signs of Syphilis

Q.—*Are there any early pathognomonic signs or symptoms of developing primary syphilitic lesion of the penis during the period of 1 to 2 weeks after intercourse? A patient who had intercourse 17 days ago complains of soreness and increased redness of the prepuce and glans, and wishes to be assured. Is it too early to rely on a Wassermann test?*

A.—The only pathognomonic sign of early syphilis is a lesion, usually a sore, in which *Spirochaeta pallida* can be demonstrated. The shortest incubation period of syphilis is said to be 10 days, the average being about 25 days. The soreness and increased redness of the prepuce and glans may be due to balanitis, but if there is any breach of surface it would be wise to examine scrapings for *Spirochaeta pallida* with the dark-ground microscope. This should be repeated at intervals. If possible the contact should

examined for signs of syphilis. A Wassermann test is not likely to be positive till a sore has been present for some days—i.e., 4 to 5 weeks from the date of infection.

Cause and Treatment of "Stitch"

Q.—An undergraduate of 18 who is a keen representative of his university in cross-country running develops while running a "stitch" in his side. What are the latest theories as to causation, pathology, and treatment of "stitch"?

A.—The "latest theory" as to the causation of "stitch" on exertion may be found in an article by Capps (*Arch. intern. Med.*, 1941, **68**, 94). He attributes it to ischaemia of the diaphragm—an idea which is attractive through analogy with other ischaemic occurrences of pain or cramp, such as angina pectoris and intermittent claudication, and is with difficulty proved or discredited, especially as, up to the present, the genesis of this very familiar bugbear of athletes has not been satisfactorily settled. In the *Guy's Hospital Gazette* (1932, **46**, 165) some investigations are described which would appear to exonerate or exclude the diaphragm. Volunteers undertook violent exercise shortly after a meal, with the consequent development of stitch, yet fluoroscopic examination while the pain was present showed that diaphragmatic movements were full and unrestricted.

A plausible explanation advanced was that of a sort of physiological visceroptosis. In the erect attitude the heaviest viscera are partly supported by the musculature of the anterior abdominal wall. When the walls are unable to provide adequate support the vertical strain on the peritoneal ligaments is intensified. During running there are intervals of complete relaxation of the muscles that maintain intra-abdominal pressure; and if violent jolts coincide repeatedly with relaxation (during respiration) the result is an intermittent tugging on the ligaments. It is evident why an additional load in the stomach, through a meal having been taken a comparatively short time before exercising, will be a contributory factor; and also why the symptom is more likely in cross-country running—as opposed to a cinder track—since rough uneven surfaces are inevitably encountered with jolting of the body, especially if the runner is of relatively asthenic build with a light springy action. It has been observed that riding on a camel with jerky action, or on a motor cycle over a rough road, often produces the same sort of pain. This explanation may apply to some cases, but it is equally likely that the pleura may be the sensitive structure implicated through tension from the diaphragm. Localization of the pain will be most commonly over the costal cartilages which are least supported and have the maximum excursion—viz., the 10th and 11th, to which are attached the longest fibres of the diaphragm. It may well be that a relatively poor blood supply to the diaphragm or intercostal muscles also enters into the aetiology. Furthermore, I am convinced that exposure to cold is of consequence—another feature which comes into line with Capps's opinion.

Since "treatment" is practically limited to cessation of the exercise, it may be presumed that the inquirer is really interested in possible prevention. I have been disappointed to find how little can be done. It appears as if the subject has a constitutional predisposition, whether for anatomical, physiological, or mechanical reasons. The obvious precaution of avoiding a heavy meal within two hours of the effort hardly needs mention, but I would again refer to the influence of cold as a factor. It is wise to warm up as much as possible before facing the outer air, and as the wrists appear for some reason to be peculiarly vulnerable, I advise wearing long mittens. I have had reason to believe that this simple procedure has been helpful in some cases.

Life of Sperms

Q.—It is stated in Eden's "Manual of Midwifery" that a living sperm has been found in the Fallopian tubes 3½ weeks after the last intercourse. If this is so, does it not completely negative "safe" periods and contradict the general opinion of the life of the sperm in the female genital organs?

A.—There are isolated reports of motile spermatozoa being found in the Fallopian tubes 2 and 3 weeks after coitus, the most frequently quoted being the two cases of Nürnberger (*Mschr. Geburtsh. Gynäk.*, 1920, **53**, 87), where active spermatozoa were found in tubes excised 13 and 14 days after the last admitted act of coitus. Such reports, however, should be accepted with reserve because they depend for the most part on the patient's uncorroborated statement as to the date of the last coitus; and again most workers who have searched for motile spermatozoa, under similar conditions, have failed to find them. Nevertheless, there are also accounts, and perhaps better substantiated ones, of the finding of motile spermatozoa in the cervix and uterus 5 to 8 days after coitus, so it seems possible that under special conditions spermatozoa can, on rare occasions, survive in the female genital tract for a longer period than that usually stated. To explain such findings, it is postulated that a thick cervical plug of mucus may, by depriving embedded spermatozoa of oxygen and leaving them bathed in carbon dioxide of their own production, maintain them in a state of suspended animation, so that when liberated and placed in a more favourable medium they may become motile several days later.

The general opinion that the spermatozoa of animals with extra-abdominal testes (including man) do not survive, or at least do not retain their reproductive vigour, for longer than 48 hours after their entrance into the female genital tract is certainly not refuted by the findings mentioned above. Indeed, this opinion has been formulated in spite of them—or at any rate only after taking them into consideration. It is based on a large body of scientific evidence derived from all manner of studies on the viability of spermatozoa of lower animals, the higher apes, and man, in the male and female genital tracts, in various tissue fluids, and in media of all kinds under varying conditions. On such matters there is now an extensive literature. So those textbooks which, in presenting the problem fairly, quote the reports mentioned, mostly conclude that it is doubtful whether human spermatozoa retain their ability to fertilize the ovum for longer than 2 to 3 days after coitus—e.g., Eden and Holland, *Manual of Obstetrics*, 1937 edition. It would seem more reasonable to suggest that the general opinion as to sperm viability, well founded as it is, raises doubts as to the accuracy of the few observations to the contrary, or at least justifies their being regarded as "freaks."

The existence of a safe period is not affected by these observations, particularly as it is recognized that such periods are relatively, rather than absolutely, safe, and that they are generally, rather than universally, applicable. Fruitful coitus during the "safe period" is not very rare, but even then, according to present evidence, it is more likely to be the result of a variation in the time of ovulation than of the prolonged survival of the spermatozoa.

Oligospermia

Q.—Is any treatment possible for a man, examined because of his wife's alleged sterility, who shows a low sperm count, decreased viability, and abnormal forms? What is the significance of semen which does not liquefy and become homogeneous? Are any of these defects more important than others?

A.—In general the hormone treatment of oligospermia is unsatisfactory and does not yield encouraging results. Theoretically, and in animals, pituitary gonadotrophic extract or that obtained from pregnant mares' serum does stimulate the seminiferous tubules to activity—e.g., in a hypophysectomized animal. In man the results are poor, especially when the total sperm count is under 10 millions per c.cm. (normal count, 100 millions per c.cm.), but occasionally good results are recorded, which critical observers believe to be *post* rather than *propter*. Some have found that small doses of testosterone propionate, 5 mg. injected twice weekly, stimulate spermatogenesis, though it is well known that large doses inhibit spermatogenesis. Where biopsy of the testes shows a histological picture incapable of being influenced physiologically, hormone therapy will have no effect. The significance given both to the degrees of viability and to abnormal forms varies with different observers and different methods. Some consider that up to 20% of abnormal forms does not indicate lowered fertility. Semen which does not liquefy is generally thought to be characteristic of low fertility, but again the criteria are not absolute. In my opinion seminal fluid which contains more than 20 million spermatozoa per c.cm., and which shows active movement of the spermatozoa in a fresh specimen, is unlikely to be the cause of sterility, and these two criteria are perhaps the most important of those mentioned.

Cardiac Failure after Convulsion Therapy

Q.—In the acute cardiac or respiratory failure which occasionally follows chemical or electrical convulsive therapy in mental disorders, is nikethamide contraindicated? Is atropine the drug of choice, or should no drugs be administered?

A.—There has been comparatively little experience of these states, and very few reports. Accordingly we do not know enough to say much. The evidence is that they are usually vagal in origin, from which it would follow that the drug of choice is atropine. The condition usually passes off quite rapidly with artificial respiration. It is much more likely to occur when an insufficient dosage or voltage has caused, not an epileptic fit, but a "sub-shock." With the electrical method, attempts to obtain a fit should be abandoned for the day if as many as three sub-shocks have resulted. Some patients need much higher voltages than others.

Ptyalism and Lacrimation

Q.—What is the cause of ptyalism and lacrimation in an elderly man, and what is the treatment for these conditions?

A.—Unilateral ptyalism and lacrimation would suggest a lesion in the seventh cranial nerve root, the geniculate ganglion, or the great superficial petrosal nerve on the same side. An irritative lesion in the area served by the sensory route of the fifth nerve should also be considered; ptyalorrhoea has also been attributed to a functional disorder of the trigeminal nerve akin to tic douloureux.

and it is possible that lacrimation might occur under the same circumstances. The phenomenon of "crocodile tears," in which the normal flow of saliva at meal times is accompanied by lacrimation, is due to injury to the chorda tympani branch of the seventh cranial nerve. Bilateral salivation and lacrimation in an elderly man would suggest either paralysis agitans or vascular degenerative changes in the cortical vessels. Presuming one of these two conditions was responsible, treatment should be by atropine or stramonium, pushed, if necessary, to the limit of tolerance as shown by disturbance of ocular accommodation.

Novocain Injections

Q.—*It is very easy to pierce a vein with the fine needle used by dentists. The anaesthetic solution usually contains 3% novocain and a variable amount of adrenaline (about 0.00002 gr. per c.cm. or more). What are the dangers of direct injection into the blood stream? How much is due to novocain and how much to the adrenaline content?*

A.—The dangers of direct injection of the anaesthetic solution into the vascular system are not great. It is unlikely that enough will enter the blood stream to produce noteworthy toxic effects unless the patient has a marked idiosyncrasy to one or other of the drugs. Intravenous administration of adrenaline is a dangerous procedure, and it is possible that the tachycardia and other systemic effects may be due to small amounts of adrenaline getting into the blood stream. It is more likely, however, that these unpleasant effects are the results of emotional disturbance causing an increase in the secretion of the adrenal medulla.

Labyrinthine Vertigo

Q.—*Is labyrinthine vertigo always associated with deafness, or can it be associated in mild early cases with hyperacusis? I find the latter vaguely referred to by Wheeler and Jack. In a case of recurrent vertigo with nausea and vomiting and slight nystagmus, does the presence of hyperacusis rather than deafness rule out labyrinthine disturbance?*

A.—Hyperacusis, or more properly dysacusis, occurs after head injuries, and also in functional conditions. Labyrinthine vertigo is always associated with some deafness of the affected ear, and it is possible that the case described is of a functional nature.

A Difficult Arthritic Case

Q.—*A man aged 59, with generalized rheumatoid arthritis, came to me last year with his right leg bent and the knee inflamed. I applied weight extension and have now put it at rest straight for 9 months. This knee now appears normal, but he has not been able to use his caliper because the other knee is inflamed. Is it safe for him to use—i.e., stand on—the right leg now, or will the disease become active again if he attempts to stand on it?*

A.—It is difficult to give an opinion on this case without further details, such as the sedimentation rate as an indication of the existence of an active infective process, and radiographs of the affected joints to show the actual condition of the articular surfaces and the density of the bones themselves. Assuming, however, that the sedimentation rate is normal or nearly so, it is likely that standing for short periods would not have any ill effects, or even walking for short distances in the house. The occurrence of inflammation, while suggestive of active disease, may be due only to the trauma of excessive use on damaged synovial tissues.

Arterial Disease

Q.—*Is the age of 38 too young to find a condition of arteriosclerosis, and can an arteriosclerosis occur in the mesenteric vessels without there necessarily being evidence of its presence in the peripheral superficial vessels?*

A.—Severe arterial disease, such as atheroma, may sometimes be found at a much earlier age, particularly in the coronary arteries. Atheroma would be the most likely form of arterial disease in the mesenteric artery. The peripheral superficial arteries give no indication of the presence of atheroma in the internal arteries. Polyarteritis nodosa may occur in such vessels as the mesenteric artery; and superficial arteries—e.g., the temporal—may suggest its presence.

INCOME TAX

Deduction of Tax from Salary

E. G. is in receipt of a pension, and also of remuneration from an appointment under a local authority. He is unable to reconcile the amounts of tax deducted with his circumstances.

*** The difficulty probably arises from the fact that while the total amount of tax to be paid depends on the total income and total allowances, as a matter of law each separate source of income requires to be dealt with separately. In the circumstances we suggest that a personal discussion at the office of the inspector of taxes, preferably by appointment, is most likely to clear up the matter.

LETTERS, NOTES, ETC.

Answers Supplemented

Dr. W. ST. AUBYN HUBBARD (Falmouth) writes: In the *B.M.J.* of Sept. 16 (p. 390) I was surprised to find no mention of liq. ferri perchlor. fort. as a paint for the palliative treatment of ingrowing toe-nail. Since seeing it recommended in the *Journal* some years ago I have often used it with gratifying results. The paint is applied to the painful sulcus at frequent intervals, the nail is allowed to grow until the whole width can be cut with a concave edge instead of the usual convex, and tight shoes or tight shrunken socks carefully avoided. Some, who dread the small radical operation, appear to carry on thus for years.

The answer given to the seasickness question (Sept. 16, p. 391) also interested me, as there was no mention of bandaging. I have spent some years at sea and under severe weather conditions have suffered myself occasionally. In treating cases I have seldom found any need for drugs if only a wide belt is *properly* applied. I used to bind my abdomen from below upwards with a wide flannel bandage as tightly as possible, and, to increase the resulting support to the viscera, I used to pack down inside the bandage one of the monthly magazines sometimes. It was rather uncomfortable, perhaps, but that was far better than feeling seasick. The whole tip is to fix the viscera and blow the discomfort. One lady to whom I recommended this, who had been very seriously ill whenever she had had to make her frequent transatlantic crossings, and had always spent the whole time in her berth, told me that she was able to enjoy her subsequent voyages. Seeing that so many of our people have to make sea voyages in the Services just now, this simple method of dealing with mal-de-mer may be well worth recommending to them.

Prefrontal Leucotomy

Dr. BRIAN KIRMAN (St. Mary Cray, Kent) writes: The statement on prefrontal leucotomy and its performance on non-institutional patients (Nov. 11, p. 650) is, I think, liable to misinterpretation. We are informed, "Leucotomy should not be recommended where patients occupy professional or highly responsible executive posts if there is a reasonable chance of recovery without operation." Surely if any patient, whatever his occupation, has a reasonable chance of recovery without this hit-or-miss operation then he should not be operated on. Surely, in particular, it is important that holders of responsible operative, as distinct from executive, posts—e.g., engine-drivers—should not be given the "more irresponsible attitude to life" which may follow the operation of leucotomy. I find it difficult to believe that any patient can suffer from a depression so mild that he can continue outside a mental hospital and yet so severe and intractable that the drastic step of leucotomy is justified. Further, it will be admitted that the final decision in any case of mental disorder must be based on the patient's conduct rather than on his thought content. Particularly must this be so where the irrevocable step of leucotomy is contemplated. Yet is there not a grave risk that if the patient be not admitted to a properly staffed psychiatric unit inadequate and unreliable information as to conduct may lead to inaccurate assessment and prognosis? Finally, no mention is made in the answers which you publish of the legal complications that may develop as a result of an operation performed on a patient (though it be with his consent) on account of mental disorder, a patient who has not been admitted to any properly organized and approved psychiatric establishment. The value of this operation in non-institutional cases is not established. The harm which it can do if inexpertly advised is incalculable. Under these circumstances is it not desirable at least to limit its use to patients in recognized psychiatric establishments until some more definite assessments of its results have been made?

Atmospheric Pressure and Rheumatism

Dr. J. S. ARCHIBALD (British Columbia) writes: I have been looking over some back copies, and in your "Any Questions?" column for March 4, 1944 (p. 347) I see where you failed to give an answer for the variation in rheumatic pains under different weather conditions. I have read recently that the low atmospheric pressure just before a storm causes a swelling of the bodily tissues which irritates the nerves around an abnormal joint, the site of an old fracture etc. When the rain comes the pressure rises, with disappearance of the pain.

The Ophthalmoscope in Examining the Tongue

Dr. R. D. LAWRENCE (London, W.1) writes: Lacking an ordinary torch and magnifying lens I recently used my ophthalmoscope with a + 15 D. lens to inspect the papillae of a sore tongue. The good light and high magnification (×18) give a most informative and gratifying view. Since then I have used it to examine rashes and other skin lesions. Perhaps this suggestion may help others.

Corrigendum

There were two errors in the heading to the article on "Chronic Intracerebral Haematomata" by Mr. Rowbotham and Dr. Ogilvie published last week at page 146. The second entry in the title should read: A. G. OGILVIE, M.D., M.R.C.P., Honorary Physician, Royal Victoria Infirmary, Newcastle upon Tyne.